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ABSTRACT

This Peace Corps training manual was developed from two existing manuals to provide a comprehensive training program in fish production for Peace Corps volunteers. The manual encompasses the essential elements of the University of Oklahoma program that has been training volunteers in aquaculture for 25 years. The 22 chapters of the manual are arranged in three sections. Chapters 1-9 introduce the aquaculture training program and provide information on the following: philosophy and methodology, goals and objectives, site requirements, length of training, trainee qualifications and assessment, staff qualifications and training, and summaries of 8- or 10-week training programs and program design considerations. Chapters 10-19 take the instructor through a 10-week program, with Chapter 10 outlining the program and the following chapters providing the training materials for each week of the program. Chapter 20 discusses program evaluation; and recommendations for in-country training. Lists of publications, equipment, and materials comprise the final two chapters. (KC)

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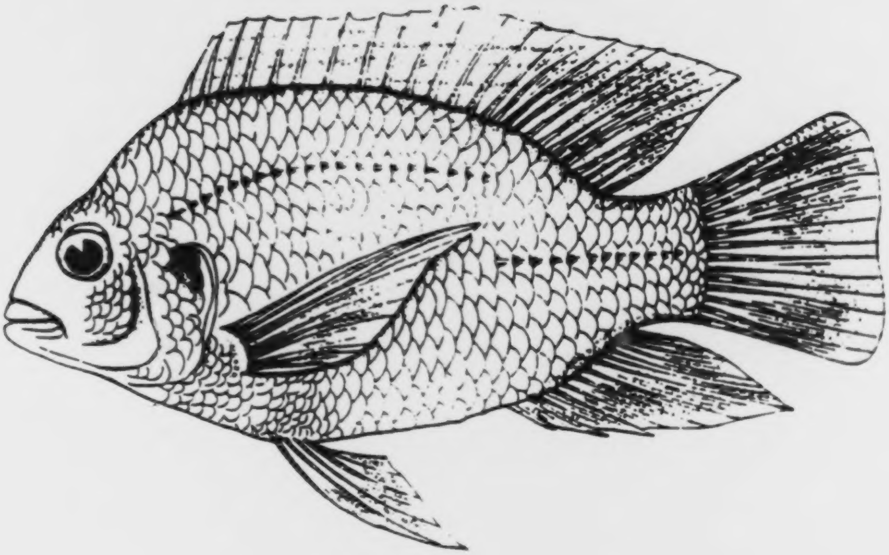
TRAINING MANUAL



PEACE CORPS

Office of Training and Program Support

TRAINING MANUAL T0057

CE 056 826

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This manual was prepared from materials included in the following two manuals:

Guide to Peace Corps Fish Culture Training by Dr. William Shelton, Anna Hiott and Eileen O'Hara at the University of Oklahoma under Contract PC-284-1006, 1987;

Peace Corps Fish Culture Training Design Manual by Fran Lowell and Roger Palm at the University of South Carolina under Contract PC-287-1005, 1990.

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DEDICATION

This manual is dedicated to Dr. Howard Paul and Effie Clemens. Without Doc's inspiration, insight, leadership and dedication Peace Corps would not have been able to make the contribution it has to international aquaculture development. He also inspired many of us to continue working in aquaculture and/or development after our Peace Corps service. As the saying goes, "Behind every good man is a good woman". Without Effie, Doc would not have accomplished all that he has. In anticipation of Doc and Effie's reaction to this dedication, the manual is also dedicated to the many past and present Peace Corps Volunteers and Staff who have contributed to the development of the training program described in this manual.

FORWARD

The training program which is described in this manual represents nearly 25 years of development. The Peace Corps Aquaculture Training Program has been evolving since training began in 1966. The basic training model was developed originally by Dr. Howard Clemens at the University of Oklahoma and has been modified over time, constantly being adapted to various training styles and circumstances, as well as to the needs expressed by field staff. Revisions have also been made based upon feedback from trainees, Volunteers, training staff and Peace Corps field staff.

Early training programs at the University of Oklahoma consisted of a single program per year, or every other year, for small groups destined for 1 or 2 countries. Between 1966 and 1974, it is estimated that 150 trainees destined for 6 countries were trained at Oklahoma. However, by the late 1970's Peace Corps' aquaculture programs had grown such that larger groups were being trained in multiple cycles each year. From 1978 through 1986, excluding 1983, nearly 800 trainees destined for 18 countries participated in training at Oklahoma. In addition, during the 1970's several countries conducted in-country technical training programs which were modeled after the Oklahoma program for approximately 200 additional trainees. From 1987 - 1989, 350 trainees bound for 20 countries participated in a stateside training program which was conducted by the University of South Carolina using a much improved version of the Oklahoma model.

In total, from 1966 - 1989, nearly 1500 Peace Corps Aquaculture Volunteers were trained using the basic "Clemens Model" which has been widely recognized as one the most effective, if not the most effective, training models which Peace Corps has utilized. The model has been controversial and has received some negative criticism. It has, however, consistently received very high marks from participants, other Volunteers, Peace Corps staff, host-country agency officials and, most importantly, the farmers with whom the Volunteers work on how well it prepares Volunteers for service both technically and non-technically. Other models have been tried by various Peace Corps countries and contractors with varying degrees of success but none have proven to be as effective as the "Clemens Model".

The Peace Corps **Aquaculture Training Manual** represents a combination of two separate but complimentary training manuals. The first is **Guide to Peace Corps Fish Culture Training** which was prepared in 1987 by Dr. Bill Shelton, Project Director, and Master Trainers, Ana Hiott and Eileen O'Hara at the University of Oklahoma. The Oklahoma manual was the first attempt to document the training program that prepared the vast majority of Peace Corps Aquaculture Volunteers for their assignments. The second is **Peace Corps Fish Culture Training Design Manual** which was prepared in 1990 by Roger Palm, Project Director, and Fran Lowell, Training Director, at the University of South Carolina. The vast majority of the current manual comes from the South Carolina manual. However, throughout the South Carolina manual reference is made to the Oklahoma manual. Therefore, during the editing process, I incorporated various portions of the Oklahoma manual. I believe this manual provides a reasonable representation of the aquaculture training program that has developed over the past 25 years. Copies of the original Oklahoma and South Carolina manuals are available through the I.C.E. resource center.

The premise for the development of this manual was to provide a basis for future Peace Corps Aquaculture Training Programs. In this way the quality of training would, hopefully, be preserved. This manual is intended to serve as the basis of Peace Corps Aquaculture Training Programs. The manual is not intended for distribution to trainees, but rather to serve as a resource for training program staff as they design their programs. New training programs (stateside, regional or in-country) will have to develop their own designs, or at least make modifications to the designs presented in this manual to reflect current program needs and the skills of the training staff.

Harry Rea
Fisheries Program Specialist
Office of Training and Program Support
Peace Corps
October 1, 1990

CHAPTER ONE

INTRODUCTION

The training program described in this manual represents nearly 25 years of development. The Peace Corps Aquaculture Training Program has been evolving since training began in 1966. The basic training model was developed originally by Dr. Howard Clemens at the University of Oklahoma. It has been modified over time, constantly being adapted to various training styles and circumstances, as well as to the needs expressed by field staff. Revisions have also been made based upon feedback from trainees, Volunteers, training staff and Peace Corps field staff. In addition, aquaculture technologies have changed constantly and significantly since the early days of Peace Corps aquaculture training. This has necessitated the inclusion of these improved technologies into the training program.

Peace Corps' approach to aquaculture development has changed significantly based on the experiences of early Volunteers and the training program has also changed to reflect this. Most of the early aquaculture projects were directed toward improving the capability of the host-country government to promote and support aquaculture development. The emphasis was on assisting large numbers of farmers with the development of subsistence-level aquaculture. Many Volunteers were assigned to government stations, while the emphasis of the extension program was on training host-agency extension agents. Peace Corps programmers believed that aquaculture development would be achieved during a single two-year Volunteer assignment. As Peace Corps gained experience it became evident that this approach would not lead to sustainable development.

During the late 1970's and early 1980's, Peace Corps' aquaculture projects experienced a dramatic metamorphosis. The idea that counterparts were a necessity faded and the emphasis shifted from subsistence to small-scale commercial aquaculture enterprises. Income generation became the driving force behind the adoption of aquaculture by carefully selected and targeted model farmers. The focus shifted to direct farmer training with the goal of farmer self-sufficiency. It was recognized that this could not be achieved in two years so current projects are usually planned as six-year or longer efforts.

Well-trained Volunteers have proven that they can be the catalyst that facilitates this type of sustainable development. But, to play this role Volunteers must be much more than aquaculture technicians. Consequently, their preparation is critical. First, they need to develop a broad foundation in general aquaculture. Second, training cannot be limited to the technical aspects of aquaculture development. It must also help the trainee to develop the personal attributes that are necessary to effectively transfer their knowledge and skills to the farmers with whom they work. Thus, when technical training ends, not only will they be technically competent, but they also will be primed for the country-specific technical, language and cross-cultural training in which they will participated during in-country training (ICT). Only in a well designed ICT program can they gain the country-specific knowledge that will enable them to effectively transfer their skills. During this period, trainees should be oriented to their role in the aquaculture project in that country. Technical and non-technical pre-service training are two crucial components of Volunteer preparation. But they are only developmental milestones in the continuous process of personal growth that is provided by Peace Corps service.

This manual is not intended to be a comprehensive, step-by-step guide to aquaculture training. Training is a dynamic process, constantly evolving, and always needs to be tailored to the unique circumstances of each program. This includes the needs of the trainees, the objectives of the aquaculture projects, and the personalities and styles of the training staff. The technical sessions described here are meant to serve as guidelines. They should be revised and adapted to the specific situations and logistical constraints of each training program. Scheduling and timing depend on a multitude of factors. The suggestions given here are examples of what has occurred in past programs, but should be changed as needed to fit new circumstances. The size of the group, logistics, backgrounds of the trainees, personalities of the groups (especially the type of leadership found within the groups), and the staff to trainee ratio will all impact upon the amount of time needed to complete the various activities. The order in which the staff chooses to implement certain exercises may also be affected. On the other hand, there is a flow of events. Many activities and exercises build on the knowledge that is gained over time and with experience. Therefore, changes in the order should be made very carefully with specific objectives in mind. The training staff must always be sensitive to the trainees with whom they are working and must remain flexible to address special, unforeseen needs that may arise. This might involve occasional revisions in the planned program when appropriate. It is always possible that a group may require a special session, technical or non-technical, that has not been included in this manual.

CHAPTER TWO

TRAINING PHILOSOPHY AND METHODOLOGY

The overriding goal of any training program must be to provide the most effective preparation for the participants so they will be able to meet their future job responsibilities. When the conditions for job performance are rigorous, appropriate training must be comparably demanding, otherwise progress toward attaining project goals will be compromised or retarded. If Peace Corps Volunteers are to be expected to foster self-reliance among project beneficiaries, then their training should foster self-reliance. Since Peace Corps' goals are based on meeting basic human needs, the human component is at the focal point. Therefore, Volunteers should be prepared to perform their technical duties within a social context.

Peace Corps' training philosophy states that training is:

- An on-going process that continues throughout service;
- An integrated process, with no single component conducted in isolation, i.e., technical skills are learned within a cultural context;
- A model of the development process that promotes self-sufficiency, problem analysis, problem-solving and critical thinking;
- Designed to include mechanisms for feedback and evaluation of trainees, and based on clear behavioral objectives that are shared with the trainees;
- Based on the belief that trainees are adults with various experiences and skills. Therefore, the training methods and techniques used must show respect for each trainee, build on their experiences and skills, and involve them in the learning process.

The training program described in this manual prescribes to this philosophy. The basic philosophy of the training program includes the beliefs that adults learn based on the experiential learning cycle, and that development of diverse skills, both technical and non-technical, is more essential than the simple transfer of technical information in preparing people for successful and fulfilling Peace Corps Volunteer service. Peace Corps has the responsibility to the countries in which it serves to provide Volunteers who have the technical expertise and personal qualities necessary to make a full two-year commitment and to be effective during their service. The role of pre-service training is to prepare prospective Volunteers for service.

This training model is a departure from the kind of learning to which people are accustomed in most academic settings. Several methods and techniques are combined in the program, but the basic premise is that training should occur within the framework of the experiential learning cycle. The basic cycle is sometimes depicted as having four main components:

- ***Experience:*** activity, problem, lecture, case study, etc.;

- ***Processing:*** "What happened?" Trainer helps trainee reflect, think critically about experience, draws attention to recurrent themes, patterns. May be individual, paired or in groups;

- ***Generalization:*** "What was learned from this?" "What more general meaning does this have?" Draw conclusions that may be generalized to real life;

- ***Application:*** Incorporate conclusion drawn to plan for more effective approaches in the future.

The ten-week aquaculture training program described in this manual can be broken down into four distinct phases, each of which has different objectives and uses somewhat different training techniques:

Phase One: Weeks One through Five - Adjustment and Skill Development
Trainees adjust to the living conditions and the site, to their peers and the staff, and to the training method. They develop observation skills, problem-solving abilities through several techniques, analytical thinking, interviewing skills and information gathering techniques. They practice self-reliance, learn to have confidence in their knowledge and thought processes, and get accustomed to taking risks. They learn many biological concepts and technical skills;

Phase Two: Weeks Six and Seven - Information Accumulation
Now that trainees have developed specific questions and a good understanding of what they want and need to know, they spend this period building their stores of knowledge through preparation and presentation of seminars (which includes access to a diversity of written and human resources);

Phase Three: Week Eight - Exposure to the United States Aquaculture Industry
Trainees test their new knowledge and skills as they explore the successes and constraints of the aquaculture industry in the United States;

Phase Four: Weeks Nine and Ten - Reinforcement of Skills and Knowledge and Application to Approaching Work Overseas
Trainees apply what they have learned to tangible field work that helps them fine tune their skills and observe their level of competence, thus building confidence in their abilities to be effective volunteers. They have the opportunity to learn about country-specific conditions and practices, and to see how they will apply their training to their work as volunteers.

In many respects, these four phases correspond to the four basic steps of the experiential learning cycle. Phase One is the basic ***experience*** upon which the rest of the program is built. Phase Two involves ***processing*** the experience, in part through pooling of data and sharing insights. The major field trip (Phase Three) permits ***generalization*** of the learning during training to the real life situation of the industry in the United States. Phase Four is the start of an ***application*** phase that will continue throughout each trainee's tour of service with Peace Corps.

In this program, the steps of the cycle are very trainee-centered. Trainers facilitate the process, but trainees must draw their own conclusions. Trainees have responsibility for their own learning. They learn through a combination of practical problem-solving and experimentation.

Throughout the first half of the program, trainees are expected to work independently of one another. The purpose of this is to build independence in problem-solving, self-confidence, and to assure that every trainee has a solid understanding of the concepts behind warmwater aquaculture. At specified times (more frequent later in the program), trainees also learn through sharing their ideas, knowledge and experience through working in pairs, small and large groups. In this manner they not only learn technical skills and material, but also practice many of the non-technical skills necessary for Volunteer effectiveness such as leadership, organization, communication, and group dynamics. Trainees learn most material through hands-on experience. They must make their own decisions and plans, and are responsible for carrying out their plans. For example, pond management is learned by doing it. Each trainee has their own pond to manage over the course of the program. The trainee makes all decisions and has complete control over what they do with the pond. Trainees must work independently in most cases, but also work in pairs and groups when specified. At first, trainees are given no technical information, no access to books, and very little direction is provided. Information is learned/gathered by experience, field trips, visiting experts, and research and presentation of seminars. Until later in the program, staff do not serve as technical resources, only as facilitators and resource providers. Over the course of training, more information becomes available as trainees develop a better sense of what they need to know.

The week-long field trip provides trainees with an overview of the aquaculture industry in the United States. Trainees learn about levels of intensity, alternative management strategies, application of the many concepts and techniques about which they have learned, concerns within the industry, etc. Typically during stateside training, the field trip has involved travel through three to four states, with approximately ten stops. Stops have included research centers, extension activities, large and small farm operations, feed mills, processors, and fish-out operations.

A key to the success of the training process is the clarification of the staff roles. Staff must provide the environment and the opportunities for learning, as well as logistical support (transportation, meals, medical care, personal needs, all equipment, materials, supplies, resources). Trainers facilitate the learning process through provision of guidance, encouragement, support, and feedback during specific technical activities. Trainees are instructed in the use of several approaches to problem-solving such as brainstorming, analogies, and trial and error. Equally important, the staff provides feedback and serves as sounding boards for concerns of the trainees regarding their performance in both technical and non-technical training activities. Finally the training staff serves as role models of professionalism and competence, and demonstrates the characteristics of good extensionists in their conduct and work.

CHAPTER THREE

GOALS AND OBJECTIVES

Training Program Goals and Objectives:
The underlying goal of the training program is to provide the in-country projects with Volunteers who have the base of skills necessary to be effective aquaculture extensionists. The main objective of the training program is to provide all the circumstances, guidance, resources, and support systems necessary to enable trainees to prepare themselves for effective service as Peace Corps Volunteers. Another objective is to help the trainees develop greater self-awareness, identify their strengths and weaknesses, and prioritize their efforts to improve in the skill areas most critical to their personal effectiveness. It is also the objective of the training program to provide an opportunity for trainees to develop their self-confidence so that when they arrive in-country they are can approach their work with enthusiasm and commitment, and establish credibility with host country nationals. As a result, at the end of training the trainees will think, talk and act like professional aquaculturists who are able to impart their knowledge and enthusiasm regarding aquaculture to others.

These training goals and objectives are consistent with the training goals which Peace Corps considers to be common to all training programs. Peace Corps training goals that apply to this training program are:

- To provide training that encourages critical thinking, information gathering and analysis, creative problem-solving, flexibility, patience and self-sufficiency;
- To develop skills that allow individuals to function effectively as a consultant, helping others to define and solve problems;
- To demonstrate the value and methods of sharing knowledge;
- To provide trainees with ways to effectively manage the communication process using listening skills, giving and receiving feedback and non-verbal communication;
- To increase the trainees' knowledge and understanding of the Peace Corps mission, general Peace Corps and country-specific policies;
- To help trainees understand the complex and slow development process including the involvement of women;
- To provide trainees with effective skills for making a transition to a new culture using observation, information gathering and validation, as well as other' assumptions as they relate to technical work;
- To provide trainees with skills that enable them to effectively manage loneliness, isolation and stress while also understanding basic nutrition, hygiene and personal heath;
- To provide trainees with a clear understanding of what is expected of them as volunteers, thus enabling them to set personal and professional goals and to measure their progress in achieving these goals.

Skills Required for Volunteer Effectiveness:
A variety of skills, both technical and non-technical, are required for any Volunteer to be effective. Strong proficiency in one area will not be sufficient without other kinds of skills as well. It would be difficult to list them all, but some of the most important skills and qualities which are addressed in the training program described in this manual include:

- High level of technical competence in a particular skill area (i.e., aquaculture);
- Communication skills (verbal and written);
- Self-confidence and self-reliance;
- Ability to establish credibility;
- High level of self-motivation;
- Sense of responsibility;
- Ability to work independently;
- Ability to set realistic goals and to develop and implement plans to achieve those goals;
- Problem-solving and analytical skills;
- Ability to remain directed, motivated and effective in ambiguous circumstances;
- Ability to function effectively, keep things in perspective and remain calm, polite and job-oriented in frustrating situations;
- Ability to work in difficult physical conditions;
- Ability to assess own accomplishments, retain sense of humor and maintain a healthy perspective about one's own work without outside support systems;
- Professionalism;
- Ability to respect others and command respect for self through comportment, sensitivity to others, job performance, appearance;
- Leadership;
- Ability to motivate others, work effectively with others on an individual basis or in groups;
- Interviewing skills (ability to obtain information);
- Creativity;
- Persistence, tenacity;
- Ability to interact and establish rapport with others at a variety of levels and in diverse circumstances;
- Honesty, integrity.

Behavioral Training Objectives - Technical:
By the end of training, the trainee will be able to demonstrate the necessary skills and knowledge in the following areas:

1. Site Selection
    - Water
        - compare advantages and disadvantages of various sources, i.e., wells, streams, springs, runoff, etc.
        - discuss importance/difficulties of gathering information regarding reliability of water sources

- Soils
    - describe, discuss various soil types, suitability for fish pond construction, etc.
    - use appropriate field tests for evaluating suitability of soils
- Topography
    - explain how various topographies lend themselves to certain pond designs.
    - use a simple model to show how topography affects layout of ponds, cut and fill
    - explain the importance of accessibility for the farmer and to the market, resources, etc.;

2. Surveying
    - Name the parts of a dumpy level
    - Use a dumpy and a hand level to survey a piece of land
    - Use a string level and A-frame;

3. Pond design
    - Discuss the following:
        - basic pond types (barrage, diversion, watershed, groundwater, etc.)
        - advantages and disadvantages of various types of ponds
        - how different pond types can be used together
        - options for layout of multi-pond systems
        - management considerations regarding pond design
        - use of canals;

4. Masonry
    - Design, construct and prepare a masonry form
    - Explain the importance and use of reinforcement
    - Mix and pour concrete, explain curing;

5. Pond Construction
    - Stake out a pond
    - Build, calculate and/or explain the importance of:
        - cut and fill
        - core trench
        - dike (toes, side slopes, top width, height, etc.)
        - volume of dike
        - compaction
        - slope (pond bottom, canals)
        - drainage/inlet structures (monks, sluices, pipes, canals)
        - anti-seep collars
        - emergency spillway/overflow
        - sealing pond bottoms (bentonite, gley, etc.)
        - machine and hand labor
        - flow rates of different diameter pipe
        - supply and drainage canals;

6. Anatomy
   - Identify and explain the function of external and internal organs of a fish
   - Describe methods of determining the age of a fish
   - Dissect a fish;

7. Physiology
   - Compare physiology of aquatic and terrestrial organisms
   - Explain respiration, circulation, digestion, and osmoregulation in a fish
   - Discuss ways in which fish respond physiologically to their environment and to various water quality conditions
   - Describe how feed habits, tolerances, reproductive habits differ among various species of tilapia, carp and catfish;

8. Taxonomy
   - Define taxonomy
   - Use a taxonomic key
   - Discuss practical applications of taxonomy
   - Discuss taxonomy of various tilapias;

9. Stocking
   - Describe the characteristics desirable in a fish species
   - Determine an appropriate stocking density for a given situation
   - Define each of the following and explain its importance in determining stocking density:
     - carrying capacity
     - factors that affect carrying capacity or biomass
     - growth rate
     - mortality
     - stocking purpose
   - Explain the effects of over and under-stocking;

10. Water Quality
   - Define the following terms and explain the fluctuations and interactions among these parameters:
     - pH, alkalinity, hardness
     - carbon dioxide
     - dissolved oxygen
     - ammonia, nitrate, nitrite
     - turbidity
     - temperature
   - Explain how the buffering system works
     - use lime to buffer a pond
   - Name sources of turbidity and explain its effects on water quality and on fish
     - demonstrate methods for measuring turbidity including secchi disk
   - Explain methods of predicting low dissolved oxygen and increasing dissolved oxygen
   - Describe effects of overfeeding on water quality;

11. Feeds
    - Discuss nutritional requirements of fish, including differences for fry, food fish, broodfish
    - Discuss nutrients in feeds
        - which nutrients are supplied by different foodstuffs
        - complete vs. incomplete diets
    - Discuss various forms of fish feed
        - meal
        - pellets
            - compare properties, advantages and disadvantages of floating vs. sinking pellets
            - describe how pellets are made
    - Explain important considerations in storage of feed and results of improper storage (i.e., aflatoxins, loss of nutrients, etc.)
    - Explain use of blood in fish feed
    - Choose the feed appropriate to a particular fish, i.e., size, form, content
    - Discuss methods of getting fish "on feed"
    - Define and calculate food conversion ratio (FCR)
        - methods for maximizing FCR
        - typical FCR for common supplementary foods and plankton bloom
    - Discuss frequency, times and methods of feeding, i.e., demand feeders, automatic feeders, ad-lib, satiation, percent body weight, etc.
    - Explain how to recognize if fish are feeding, if they are overfed or underfed
    - Explain the "food chain"
    - Discuss how fish are adapted to certain feeding habits
    - Formulate a diet using rice bran, peanut cake, blood meal, corn;

12. Fertilization and "Bloom Management"
    - Define limiting factor and list/explain limiting factors in pond
    - Discuss the following for inorganic and organic fertilizers:
        - characteristics
        - examples
        - when to use which
        - how they can be used to complement each other
    - Compare nutrient levels of different manures
    - Apply fertilizer
    - Build a compost
    - Describe methods of getting a bloom in acidic waters
    - Explain meteorological effects on a bloom;

13. Sampling and Growth
    - Discuss the role of sampling
    - Describe the range of sampling techniques available, i.e., cast net, seine, traps, electroshock, lift nets, etc. and explain advantages and disadvantages of each
    - Discuss considerations for sample size, frequency
    - Interpret sampling data
    - Calculate and interpret condition factor

- Name factors that affect growth
- Calculate and evaluate growth and FCR
- Project harvest times
- Discuss normal growth patterns;

14. Parasites and Disease
    - Classify disease organisms that affect fish
    - Discuss problems that may be caused by pollution and nutritional deficiencies
    - Describe relationship among stress, parasites and bacterial/viral pathogens
    - Describe, from the general to the specific, indicators of disease problems
    - Describe how fish should be examined for parasites or disease
    - Discuss symptoms generally associated with certain types of disease or parasite problems
    - Discuss common treatments used in fish culture, their characteristics and special considerations regarding their use (salt, potassium permanganate, copper sulfate, malachite green, terramycin, acriflavin, furacin, formalin, etc.)
    - Describe methods of treatment (dip, bath, pond, treated feed, etc.)
    - Accurately calculate dosages
    - Discuss legal aspects of use of chemicals including FDA/EPA regulatory requirements
    - Discuss other considerations when deciding about use of chemicals (cost, stress to fish vs. stress of disease itself, etc.)
    - Discuss how diseases are transmitted
    - Discuss how disease can be prevented;

15. Reproduction
    - Explain differences between reproductive habits of various groups of tilapias, i.e., *Tilapia*, *Oreochromis*, and *Saratherodon*
    - Discuss how fecundity, frequency of spawns, age of sexual maturity, hatch rate, fry survival, differ among various tilapias
    - Discuss management of tilapia ponds for fingerling production
    - Discuss other techniques used to spawn and rear tilapia
    - Discuss catfish reproduction and management of catfish broodponds and broodstock
    - Discuss techniques used for carp reproduction (pond spawning, hormone induced spawning)
    - Discuss management of carp broodstock
    - Discuss trout reproduction
    - Accurately sex tilapia
    - Explain removal of pituitary and injection
    - Demonstrate proper care of fry
    - Discuss basic genetics/techniques for hybridization and sex reversal;

16. Hybrids
    - Define "hybrid vigor"
    - Discuss possible reasons for hybridizing
    - Discuss the following for popular hybrids used (e.g. red tilapia)
    - Success rates

- Maintaining separate broodstock
- Long-term considerations;

17. Handling
    - Demonstrate proper handling techniques with minimal stress to fish
    - Discuss special handling considerations for fry, foodfish, broodstock
    - Count, weigh and measure fish accurately
    - Acclimate fish to a new environment;

18. Predation and Theft
    - List common predators in fish ponds
    - Explain methods for preventing predators from entering ponds
    - Explain methods for removing predators from ponds
    - Describe strategies for minimizing theft;

19. Nets
    - Describe parts of a seine and cast net
    - Describe different types of nets and their uses
    - Describe different types of mesh, how netting is measured, etc.
    - Describe proper care of nets (treating, sunlight, drying, hanging, etc.)
    - Weave and repair netting
    - Hang a seine
    - Demonstrate effective use of a cast net and a seine;

20. Harvesting
    - Successfully harvest a pond
    - Successfully seine a pond
    - Explain the following strategies:
        - partial vs. complete harvest
        - top-off and restock
    - Describe the use of catch basins, live cars, graders, tables, etc.;

21. Processing, Preservation and Preparation
    - Demonstrate ability to kill and clean fish utilizing several techniques
    - Understand basic role and operation of processing facility
    - Explain range of preservation methods and level of technology involved;

22. Transport
    - Discuss preparing for a transport, i.e., people, delivery point, equipment
    - Prepare fish for transport
    - Discuss the importance and/or use of:
        - conditions (time of day, temperature, oxygen, ammonia, etc.)
        - aeration
        - use of salt or other chemicals in transports
        - densities for transports and its relationship to length of trip, fish species, temperature, etc.
        - types of transport containers (tanks, drums, jerry-cans, plastic bags, etc.)

    - explain how transporting fry, fingerlings, foodfish, brooders differ
    - set up a truck with tanks and aerators;

23. Intensive/extensive systems
    - Define the terms
    - Discuss the factors that vary with level of intensity (time, labor, cost, inputs)
    - Explain reasons for choosing a particular level, i.e., purpose, goals (fish for food or fish for profit), diminishing returns;

24. Level of complexity
    - Describe cases in which each of the following would be appropriate or inappropriate:
        - single species crop, mixed sex, no population control
            - stock young, grow out, harvest completely - stock mixed sizes, continuous cropping
            - single species crop, mixed sex, with population control
            - use of predator fish (not for harvest)
            - monosex
        - polyculture (all for harvest)
            - use of different food niches
            - predator as a second crop;

25. Integrated Systems
    - Discuss methods and the appropriateness of:
        - rice/fish
        - large animals/fish, especially swine
        - poultry/fish
        - small animals/fish
        - fish/gardens
        - integrated farms
        - multiple pond systems
        - rotating harvest;

26. Culture Systems
    - Design and explain the use of:
        - cages
        - raceways
        - hapas
        - pens
        - tanks
        - others;

27. Basic Management Strategy for *Oreochromis niloticus*
    - Describe a step-by-step plan for simplest effective production of this species
    - Explain biological and economic principles for each step;

28. Maintenance
    - Perform all required pond maintenance tasks, including:
        - erosion control
        - care of vegetation
        - water management
        - care of inlet/drainage structures, emergency spillways, screens on inlets, drain, spillways;

29. Accounting
    - Develop a budget for a fish farm
    - Explain fixed and variable costs
    - Explain amortization, depreciation
    - Discuss considerations for maximizing profits;

30. Economics
    - Define diminishing returns
    - Define economy of scale
    - Determine the economic feasibility of a project
    - Discuss funding sources and methods of finding them;

31. Marketing
    - Define supply and demand
    - Explain the role marketing plays in stocking and harvesting decisions
    - Discuss determining market needs, i.e., size of fish
    - Discuss various marketing strategies
    - Discuss price-setting
    - Explain the need for advertising and presentation of product;

32. Extension
    - Define extension
    - Discuss extension education as opposed to giving instructions
    - Discuss how psychology and sociology are part of extension
    - Discuss "intensive" vs. "extensive" extension
    - Discuss the importance of the following characteristics of a good extensionist:
        - professionalism
        - technical credibility
        - active listening
        - cultural/social sensitivity
        - communication skills
        - interpersonal skills
        - powers of observation/perception
        - recognition that extension is a 24 hour a day, 7 days a week job
    - Effectively gather and assess information
    - Set appropriate goals for an extension program
    - Explain farmer selection
        - setting criteria
        - innovator, early adapter, etc.

        - "dropping" farmers, saying "no"
    - Discuss and/or use the following methods/techniques:
        - farmer visits
        - meetings
        - contact farmers
        - developing a feeling of community
        - cooperative projects, possible advantages/disadvantages/problems
    - Common extension tools
        - appropriateness/effectiveness of each in different situations/local cultures
        - advantages/disadvantages, possible hidden problems with some of these tools:
            - analogies
            - visual aids
            - songs
            - role plays
            - field trips
            - workshops/seminars
            - games
            - incentives (awards, "decorations", etc.)
    - Define "model farmer" and explain its importance
    - Define and employ appropriate technology;

33. Administration
    - Explain and/or be effective at the following:
        - Considerations for working within a bureaucracy
        - Chain of command, organizational structure
        - Motivating others
        - Communication
        - Program planning and evaluation
        - Writing project proposals
        - Record keeping and report writing.

Behavioral Objectives - Non-Technical:

In addition to the above technical behavioral training objectives, there are additional skills, traits and abilities that play a key role in the degree of effectiveness which a volunteer experiences overseas. By giving careful attention to these non-technical objectives during design, facilitation and assessment activities, the training staff can have a major impact on volunteer productivity and satisfaction. However, these non-technical areas must be addressed with extreme sensitivity and a heightened sense of responsibility. Suggestions can be found throughout this manual. The following non-technical behavioral training objectives are particularly critical:

- Professionalism (conduct, appearance);
- Goal setting;
- Assessment of one's own work;
- Dealing with frustration/ambiguity (remaining job-oriented);
- Interviewing/Assessing credibility/Information gathering;

- Looking at things in a critical way;
- Cross-cultural sensitivity;
- Self-awareness;
- Working in groups/organizational skills;
- Leadership;
- Taking advantage of opportunities/initiative;
- Get a feel/eye (practice, hands-on experience);
- Enthusiasm;
- Problem-solving (brainstorming, creative thinking, analytical thinking);
- Observation skills;
- Development of self-confidence;
- Writing skills;
- Taking/accepting responsibility;
- Working independently;
- Tenacity, perseverance;
- Self-assessment.

CHAPTER FOUR

SITE REQUIREMENTS, LOGISTICS AND LENGTH OF TRAINING

Site Requirements:

- At least one pond per trainee is essential (more is better), with a minimum area of 100 square meters, and a maximum area of about 300 square meters. Each pond should have an individual water supply and be fully drainable by gravity flow. Trainees must have complete control over the management of their ponds. In other words, ponds should not be under the direction of government officials, university faculty, etc. while the training program is in progress. If the facility belongs to the government, a university, or a private farmer, very clear arrangements should be made and be well documented to prevent any disagreements or interference during the training program;

- The climate and water source should be such that warmwater conditions suitable for tilapia exist at all times;

- The ponds must have a reliable water source that is adequate to supply several ponds simultaneously. Drainage must also be good and must be adequate to enable trainees to drain ponds completely whenever necessary;

- Fish holding facilities should be present on the site, within a reasonable distance from the ponds so that trainees can hold fish temporarily when stocking, sampling, harvesting or transporting, or as needed for special projects. Tanks, raceways, or cages in extra ponds are examples of temporary holding facilities;

- Protected sheds (from rain, direct sunlight, insects, small animals, etc.) for storing equipment, feeds, and fertilizers are important. Sheds should be used exclusively by the training program (not shared with outsiders) so that trainees can have complete control over how they are managed and maintained;

- Access to sufficient quantity, quality and species of fish is imperative. Tilapia, *Oreochromis niloticus* in particular, are the most important. Other species such as catfish and carp are good. It is helpful to also have access to any other fish with which the trainees may work or to which they may have exposure to in their countries of assignment;

- Access to several species of tilapia is extremely helpful for learning taxonomy. It is especially valuable to have samples of those tilapia species that are found in the areas in which the trainees will serve;

- There must be an appropriate and sufficient quantity of equipment and supplies (see Chapter 22 for specifics) to ensure that trainees are not limited in their work by having to wait for equipment;

- Access to inputs used for raising fish is also imperative. This should include a variety of feeds, fertilizers, manure, and other composting materials;

- There must be nearby surroundings conducive to site selection and pond design exercises. Important considerations include water sources, diverse terrain adequate for construction of ponds, and good soils with enough clay content to hold water;

- Access to other fish farms, research ponds and/or private or government hatcheries being managed by people outside the program are important for information, field trips, extension work, and providing work experience for trainees;

- Access to human resources working in the industry and various related facilities is also critical for providing information through interviews, lectures or field trips. Examples of important human resources include farmers, processors, feed mills, extension agents, government officials, university faculty and staff, contractors, markets, live-haulers/transporters, researchers, and diagnosticians;

- Adequate classroom space is essential. There must be enough room, chairs, and desks to permit the entire group of trainees, all staff and visitors to sit comfortably and to be able to see, hear and write as needed. Good lighting and ventilation are critical. Heat or air-conditioning (or fans), if appropriate, may also contribute to providing an environment that is conducive to good concentration. Classroom(s) should be furnished with a blackboard, and with electrical outlets for slide projector, aquarium pumps, etc.;

- The site must also have suitable space in which trainees can work individually and/or in small groups, and space in which large groups can meet and work. There must also be areas where trainees can work one-on-one with their trainers with enough privacy to minimize distractions and permit confidentiality if needed;

- An adequate place is needed in which the training library can be set up. There should be sufficient room for all materials to be properly stored and accessed;

- There must be areas where formal interviews can be conducted. These should be private, quiet and comfortable with enough seating for at least five people;

- Trainees must have quiet study areas where they can work in the evenings. These areas should be very convenient to the lodging facility (preferably located somewhere at the lodging facility), with chairs, tables, good lighting and comfortable conditions;

- There must be sufficient office space to comfortably accommodate all training and support staff. Staff facilities should include a desk and/or workspace for each staff member, a meeting area for staff meetings, and storage space for classroom and office supplies;

- The training site should be isolated enough to minimize distractions and facilitate a total focus on the objectives of the training program. To provide relaxation, social and recreational releases and interactions with the community, there should be recreational equipment and/or facilities on or near the site, scheduled free time and weekend outings.

Logistics:

- Facilities for good, wholesome, large meals should be as close as possible to the pond area. Arrangements should be flexible enough to accommodate departures from normal schedules or numbers of people, very early breakfast hours and occasionally rather late suppers, and take-out "brown-bag" type lunches (or breakfasts) upon request (for field trips or other special activities);

- Living space may be very simple, but trainees should not be so closely packed as to create stress among the group. Lodging should be as close to the ponds as possible, walking distance is best;

- Adequate security should be provided to ensure safety for the trainees and their belongings;

- If staff members do not all live at the same facility, it is important to have some means of communication between them. A telephone or two-way radio at the staff housing facilities is a necessity (this may not be possible in some in-country training situations). This is critical in case of emergency, and can greatly increase efficiency;

- Conditions at the living facilities must take into account the realities of housing a large group of people for a long period of time who are working many hours, keeping late hours, getting very dirty, etc. If the facility is being shared with guests from outside the program, it is preferable to have trainees together in one area, and if possible, somewhat apart from other guests. There should be some area where trainees can hang out wet, dirty clothing and boots without disturbing other people or creating ill feelings with proprietors of the facility;

- There should be adequate bath facilities to avoid too much waiting in the mornings. (3-4 trainees per toilet/shower);

- Laundry facilities must be convenient enough to be accessible to trainees as needed, preferably without having to rely on staff for transportation. At a minimum, trainees must be able to do laundry during the weekends;

- Trainees should have access to a post office, stores, and other services for personal needs if possible. If this is not possible, some arrangements must be made to ensure that trainees needs are met;

- Ready access to good medical and emergency care is imperative. The medical officer who is associated with the program must be willing and able to work with Peace Corps and must be available on short notice for individual problems and emergencies. There must be provisions for 24-hour emergency care, and a convenient pharmacy for filling prescriptions;

- Some form of recreation must be available to the trainees. If the site is not near a town or park, provide a volleyball net and ball, basketball equipment, frisbees, etc. Some kind of area (like an open field) for recreational activities should be near the lodging facilities and available to the trainees in the evenings. Often, there will be trainees who like to jog. The staff should research this ahead of time to identify safe areas. Trainees should be encouraged to jog in pairs or groups. Procedures should be set and clarified with trainees regarding injuries that may result from recreational activities;

- Access to a local community outside of the training group is important for providing a break from training activities, opportunities for social events and interactions, and practicing some of the non-technical skills trainees are encouraged to develop during training;

- Adequate transportation is critical. Vehicles must be safe and in excellent condition. If living and meal facilities are within walking distance of the ponds, there is a little more flexibility regarding vehicles than if not, though there must always be enough room in vehicles for all trainees and staff (and perhaps a few guests) to travel at the same time for field trips or other events. If trainees cannot walk from the living quarters to the meal facilities and/or from living or meal facilities to the ponds, then vehicle availability and coordination become even more involved. There should be enough vehicles and drivers to accommodate emergency trips or trainees who need to go to the ponds early, stay late, etc. Also, if trainees are dependent upon training vehicles to go shop ping, do laundry or other personal necessities on weekends, the same kind of flexibility is needed;

- Given the schedule of training, it will be difficult for trainees to have easy access to services such as the post office or bank during business hours. This is even more difficult if the site is far from any town or stores. Depending upon the situation and needs, the staff should arrange systems for trainees to buy stamps, cash checks or purchase necessary personal items. This may mean that the staff keeps rolls of stamps to sell to the trainees and sets up an on-site box for outgoing mail. A staff member may need to set up a regular schedule, perhaps one day a week, to go into town and run errands (this is not meant to get out of hand, just for basic necessities such as check cashing or emergency purchases, etc.). For check cashing, staff will need to visit with bank personnel and find out exactly what procedures must be followed to enable them to cash trainees' checks;

- Mail is an important issue. Trainees' mail is very important to them. Have as efficient a system as possible for in-coming and out-going mail, do not forget or delay distribution of incoming mail.

Length of Program:
For most of its history, Peace Corps aquaculture training has been ten weeks long. These ten weeks have always been completely full, very busy, very hectic and have never felt like enough time to adequately cover all of the material, skill development and hands-on

experience that are necessary to bring trainees to a sufficient level of competence and confidence in their own skills. Although a longer program than ten weeks would be helpful from the standpoint of learning as much as possible, it would probably be too long to expect trainees to sustain their enthusiasm. Training is very hard work and requires a tremendous amount of effort and stamina, the level of which could not be expected to be maintained for longer than the ten weeks unless the pace of the program were changed. It might be possible to successfully combine technical training with language and cross-cultural training for a longer total training period, but a great deal of thought would have to be given to this to determine the feasibility of such a program. Since aquaculture training involves working with live animals, precise scheduling is not always possible. There are many situations that cannot be predicted (i.e. fish disease or mortality, water quality crises, etc.), and the logistics can be complicated (for example, a pond construction project may require travel time and transportation of a lot of equipment so that it would not be reasonable to try to block it into two hour blocks that would fit nicely around a language class schedule). Thus, any other components of a combined program would have to be extremely flexible to accommodate the nature of aquaculture training.

Recently, Peace Corps chose to shorten the stateside aquaculture training program to eight weeks due to budgetary constraints. The revisions in the design that were necessitated by this change included shortening some components, speeding up some components and even eliminating some components. More details are provided in Chapter Eight. The major disadvantages of the shorter program are not so much related to the actual technical material that is covered (though this is a definite concern), but relate more to the learning and skill development processes, stress on the trainees and staff due to the amount that must be done with even more difficult time constraints, and to the trainees' level of confidence in their own preparedness to do their jobs. The advantages of the shorter program are that the trainees have a shorter period of time during which they must sustain high energy levels and the staff has a longer break between cycles. Some Peace Corps staff feel strongly that the disadvantages out weigh the advantages, and that the training program should be ten weeks long. The kind of skill training which they consider critical to Volunteer effectiveness takes time to conduct properly but is highly efficient when viewed over the entire period of volunteer service.

CHAPTER FIVE

TRAINEE QUALIFICATIONS AND ASSESSMENT

Trainee Qualifications:

- A background in biology or a related scientific area is definitely helpful, and often allows a trainee to grasp technical concepts more quickly and easily than a trainee who lacks this type of background. However, a science or even a fisheries background does not stand on its own and should not be considered the only, or even the most important, qualification. A trainee with a different academic background but who possesses many of the other important qualities of a good volunteer can be just as successful in the training program;

- Trainees must possess basic math skills and be able to communicate effectively in writing and orally. Although they will have the opportunity to further develop their analytical thinking and problem-solving during training, they should arrive with some ability in these areas. Trainees should be intelligent, have common sense, and be capable of creative thinking;

- Probably the most important trainee qualifications relate to personal qualities they will need to be effective Volunteers. These include: maturity, sensitivity, sense of responsibility, integrity, honesty, self-motivation, willingness to work hard, flexibility, sense of humor, self-awareness, self-reliance, curiosity, commitment and an open mind, willing to consider new and different perspectives, ideas and approaches to learning.

Trainee Assessment:

The purposes of trainee assessment are to:

- Evaluate the trainee's progress in all aspects and phases of the program;
- Determine whether the trainee is meeting the requirements of the program and achieving a sufficient level of competence within the assessment dimensions of the program;
- Inform the trainee of the staff's evaluation of his/her progress in the program;
- Provide trainee with feedback that will help the trainee to identify and recognize strengths and weaknesses, encourage the trainee to use and enhance recognized strengths, and provide suggestions for improving on weak areas;
- Provide trainee with an opportunity to discuss concerns, fears, requests and/or questions regarding performance in training and to get another perspective on what the trainee perceives as his/her strengths and weaknesses.

As previously stated, the goal of the training program described in this manual is to provide the in-country projects with Volunteers who have the base of skills necessary to be effective aquaculture extensionist. In order to ensure that this occurs, it is essential that each trainee's progress towards meeting the technical and non-technical goals of the program be closely monitored and assessed throughout training. Assessment is an extremely important part of the training program, as important as the technical component. It addresses all of the skills and qualities a Volunteer must possess in order to be effective.

The underlying premise is that every individual who enters training has a valuable contribution to make to Peace Corps and the host country. The purpose of assessment is not to deprive anyone of the opportunity for personal growth and the positive lifetime experience of having served as a Peace Corps Volunteer but, rather, to ensure that the individual puts as much into and gets as much out of the experience as possible. Assessment is often looked upon in a negative way, with the emphasis on the misconception that it is part of a "weeding out" process. In reality, it serves a very positive function in providing the kind of feedback, guidance and self-examination that will allow a trainee to develop his/her skills, positive personal qualities and confidence to the maximum extent possible. However, it is also recognized that the trainee may be better suited to another project or that he/she may not yet be ready to make the necessary commitment.

In the training program described in this manual a strong emphasis is placed on self-assessment. Trainees are encouraged to observe and reflect upon their own actions, skill development, reactions to new situations and challenges, and feelings about their work. Rather than posing a threat to trainees, the way assessment is handled should create an atmosphere that allows people to decide, without guilt, resentment or feelings of failure, whether or not the aquaculture program is right for them at this point in time. If a trainee has reservations about joining Peace Corps or being in the aquaculture program, then he/she should be able to discuss this with the staff and receive objective, supportive and truthful feedback. If, after careful consideration, a trainee decides to leave the program, this should be treated as a positive step toward finding the best, most appropriate vehicle for that trainee's particular skills and interests, not as an admission of failure or "quitting".

Trainee assessment is a delicate and difficult process. This is compounded by the fact that trainees are not assessed solely on their knowledge and performance in the technical components of training. If this were the case, assessment would be relatively easy and objective. In order to keep the assessment process as objective as possible it is essential that the assessment dimensions of the program be clearly defined and understood by all people concerned, trainees and Trainers alike, and that trainee performance be measured against a set of technical and non-technical behavioral objectives as are described in Chapter Three.

During orientation, trainees should be given a form that lists the grounds for administrative separation and the assessment dimensions of the program. They should keep one copy for their own information, and sign and return another copy for the staff files. In preparing for personal interviews, trainees should be asked to refer to the assessment dimensions to help them assess their own progress and performance in those areas.

The basic assessment dimensions which have been developed by Peace Corps, and which apply to the program described in the manual, serve as a means of organizing objective technical and non-technical behavioral data. They emphasize to the trainee the importance of the non-technical objectives of the program.

The assessment dimensions used in this program are:

- Technical competence;
- Productive competence;
- Motivation;
- Social sensitivity;
- Emotional maturity.

Trainee Self-Assessment:
As previously stated, a great deal of emphasis is placed on trainee self-assessment. Trainees are encouraged to be honest with both the staff and with themselves as they go through the program and learn about their own strengths, weaknesses, qualities, reactions and behaviors. Trainee self-assessment is encouraged through means such as group discussions, peer and self-critiques, and self-evaluation instruments that are filled out in preparation for personal interviews. Trainees are encouraged to seek out a meeting with any staff member he or she chooses at any time in order to discuss concerns related to self-assessment. It is not necessary for a trainee to wait for the regularly scheduled interviews to get input from staff members or to discuss issues about which they are concerned.

Staff Assessment of Trainees:
Staff assessment of trainees takes place through several means:

- Observation of trainees by staff and collection of objective behavioral data;
- Frequent one-on-one contact between trainers and trainees throughout all phases and training activities;
- Pond interviews with trainees to gauge technical comprehension and application of leanings to pond work;
- Written reports submitted by trainees on technical activities and other training activities;
- Quizzes (usually unannounced and open-book);
- Projects and tasks (e.g. surveying projects);
- Regularly scheduled individual personal interviews;
- Special personal interviews at the request of either staff or trainee.

Assessment is a delicate area and requires a great deal of skill, sensitivity and judgement on the part of the staff. A great deal of attention should be paid to this aspect of the staff's role in training. If the assessment component is handled properly by the staff it is a very positive aspect of the program that will help trainees to fulfill their potential and gain self-confidence. If it is handled poorly, it can break down all trust between staff and trainees, have a negative effect on trainee attitudes and efforts, damage trainee confidence and self-esteem, and/or allow trainees to go to their countries of assignment unprepared to do their jobs well.

Collection and Organization of Behavioral Data:
Behavioral data is collected throughout training and consists of very specific, detailed information including examples of trainees' actions, responses to a variety of situations and challenges, comportment, job performance and/or any other data that will aid staff in giving trainees useful, meaningful, clear feedback during interviews. This data also becomes very important in the event that an administrative separation becomes necessary in that it is the basis for the required documentation.

It is necessary to collect behavioral data in writing because staff members cannot be expected to accurately remember such detailed information for large numbers of trainees. The physical task of collecting the data is uncomfortable for both staff and trainees, so as much as possible should be done to acknowledge this and relieve stress. Although staff are encouraged to be discreet and sensitive in the way they handle this, the fact that behavioral data is being collected cannot and should not be kept secret from the trainees. Discussing the necessity of collecting behavioral data and informing trainees about how this data will be used can help alleviate at least some of the stress trainees feel when they know they are being observed. If the staff is responsible and professional, it eventually becomes less of an issue for trainees. In collecting behavioral data, trainers should be thorough and accurate. It is easy to underestimate the difficulty of this task, and it should be addressed in depth during staff training. It is essential that data be collected as closely as possible to the time that events occur. With so much going on and so many more trainees than trainers, it is impossible for trainers to accurately remember details for long. It is a common misconception for new staff to think that they can put off writing things down until the time is more convenient, but this is a mistake because there is so much going on at any time. Unrecorded data builds up and becomes less clear in the trainer's mind, and then becomes a very large, intimidating task that requires tremendous discipline and a lot of time to finally sit down and write. Distortion is a real problem when data is not recorded properly. Trainers must also be sensitive about how they record data. If possible, they should be discreet, but not secretive, in order to minimize distractions and stress for the trainees. It should not be necessary to whip out a notebook and write furiously within inches of a trainee's face as he/she struggles with a difficult task. If a trainee is obviously nervous and appears to be under a great deal of stress because of the trainer's presence, the trainer should refrain from taking notes until it can be done in an unobtrusive way.

Behavioral data must be objectively stated, very specific and very clear. In general, data should be statements of facts, i.e. this happened, this was said, etc. Personal judgements on the part of the observer are not usually relevant, though in some cases they may be worth noting as long as they are clearly described as such. (For example, it would not be an objective statement of fact to write, "Mary did not participate in the group discussion on fish farming for profit as she usually would because she was in a grouchy mood and was sulking about her confrontation with Bob (trainer) this morning in which he reprimanded her for breaking the rules of individual training." The appropriate observation to note here would be, "Mary did not make any comments or ask any questions during the group discussion on fish farming for profit. She appeared to be unhappy and inattentive." However, in this particular case, it would also be appropriate for the trainer to note something like; "My note: She appears to be unhappy and distracted, although she participated quite actively in yesterday's discussion. She was talkative and friendly at breakfast and her mood seems to have changed since her conversation with Bob about individual training before this meeting. Perhaps that conversation affected her participation in this discussion? If she continues to appear unusually withdrawn for the rest of the morning, may want to check with her to see if she wants to talk.") In addition to the data itself, it is important to include information that puts the data into context. In order to do this, include dates, times, during what particular activity or session incidents occurred, etc.

Behavioral data usually becomes useful when it helps demonstrate patterns or significant changes in a trainee's actions, behavior or performance. Isolated occurrences of a specific type of behavior or reaction may not be important and it often seems unnecessary to record them, but unless they are recorded it is difficult to see patterns emerge or changes occur. This is often difficult for trainers to realize, so valuable data can be lost. Staff should document all significant observations. If certain actions do turn out to be very isolated, they may never be referred to, but if, over time, a pattern becomes clear, then the series of observations that form the pattern become extremely important to have. There is a tendency to record more data to support negative feedback than positive points. Staff should be encouraged to strive for balance and to record both positive and negative behaviors, actions or results.

Organization of behavioral data is critical and is usually a difficult task. If the data is not well organized, it will probably not be used and will serve no productive purpose. This is one of the most difficult staff duties and should not be permitted to go unattended. Several systems have been tried and a perfect solution has not yet been found. One approach is to set up a behavioral data file for each trainee, with one trainer in charge of keeping these files organized and notifying staff about trainees who are being overlooked. Data should be kept in chronological order. It may be helpful to clip together all data that is collected (within each individual file) by periods between interviews, i.e. all data that is in the file from day one until the first personal interview would be clipped together, all data collected between the first and second personal interview is clipped together, etc. This may aid in keeping track of what was discussed at each interview and in tracking progress.

Personal Interviews:

Formal personal interviews are scheduled at approximately two week intervals throughout the program. Actual scheduling depends upon the length of the program and how the interviews will fit in logistically with other training activities. The structure of the personal interviews may vary, but a general approach is clear. The Master Trainer is present at all interviews. In each interview, at least one Assistant Trainer is also present. The interview begins with the trainer asking the trainee a few questions (specific examples will be given in the Program Design chapters). The questions may lead to some discussion. Following this, if some self-evaluation instrument has been used, the trainee is asked to discuss his/her responses, and the staff provides input and feedback. During this period, the staff may present their own points of view regarding the trainee's analysis of his/her performance, either concurring with or disagreeing with the trainee's assessment, and/or raising issues the trainee has not brought up. If there is disagreement between the trainee's and the staff's assessment of some area of performance, this is explored further so that each side may gain an understanding of the other point of view, misinterpretations can be corrected, etc.

Often, trainees are quicker to see their own weaknesses than their own strengths, and the staff must be sure to provide the trainee with feedback about areas of strength. If there are negative feedback points or areas the staff and/or trainee feel should be improved, the staff helps the trainee clarify, prioritize and plan some strategy for working on that area. After all issues raised by the questions and the self-assessment instrument have been discussed, the Master Trainer asks whether there is anything else that the trainee would like to talk about. Before ending the interview, the Master Trainer should summarize the main points that came up, especially a well balanced summary of the trainee's strengths and what has been identified as areas in which the trainee would like to improve.

Although the usual procedure is to have the Master Trainer and at least one Assistant Trainer present at each interview, this is flexible. Trainees may request to have any assistant Trainer(s) present or not present at their interviews. If the trainee wishes to meet with an Assistant Trainer without the presence of the Master Trainer, a separate interview with that Assistant Trainer can be arranged. The trainer that is chosen to attend each interview is selected based on the amount of interaction the trainer has had with the trainee, how closely they have worked together, and the kind of rapport that exists between the trainer and trainee. In some cases, it may be necessary to have more than the usual two staff members present at an interview. This is usually the case in a situation where an administrative separation or a resignation is a possibility. In this case, it is desirable to have more staff members present in order to get the most accurate documentation possible regarding the content of the interview.

A delicate area is the question of whether or not staff members should take notes during interviews. It is important to have documentation of what was discussed and what occurred in each interview (in order to provide smooth continuity in the following interview, as well as for documentation in the rare case of an administrative separation). Yet the environment in an interview should be open and non-threatening, and the staff taking notes could make a trainee very uncomfortable and less willing to express concerns or raise issues. It is suggested that, in all but extreme cases, few or no notes be taken during the interview. If a staff member would like to jot down a few thoughts while the trainee is talking in order to be able to respond to those points, that is fine as long as this procedure is explained to the trainee. After the trainee leaves the interview, the staff members present should take a few minutes to record the key points of the interview, especially what feedback was given, what the trainee identified as his/her own strengths and weaknesses, and any strategies that were developed for working on areas the trainee targeted for improvement. These notes will serve as a reference for the staff, allowing them to make a point of tracking the trainee's progress in specific areas and provide the kind of feedback the trainee has expressed interest in, as well as allowing for a smooth transition to the next interview.

An interesting phenomenon that became increasingly clear throughout the three years of this training program (especially based on feedback from volunteers who were trained here and reported back after working in the field for a while), is that trainees are much more likely to remember and emphasize even the mildest negative feedback than even the strongest positive feedback. Even if the staff makes a point of giving balanced feedback, the trainees do not receive it, do not hear it as the staff thinks they are presenting it. It is therefore incumbent upon the staff to discover ways to deal with this. There may be no solutions to this problem that will be effective in every case, but based on attempts made here, there are a few suggestions we can offer. First, begin the feedback and end the interview with stress on the positive points. Using self- assessment instruments is very helpful because it draws out the trainees. The more talking the trainees do in the interviews, the better. While there are exceptions, trainees seem to have a tendency to be harder on themselves than the staff would be. They will feel much less threatened if they are the ones to identify and initiate discussion of the areas in which improvement is required. They will be more honest with themselves when they are not put into a position of feeling as if they must defend themselves. The staff can then offer support in the form of encouraging the trainees and offering suggestions for strengthening the areas the trainees have cited. Often, the staff can help the trainees put things into a clearer perspective, and will be able to put more emphasis on the positive points to balance the points raised by the trainees. Help the trainees recognize their strengths and how these can be used to overcome problems or develop better skills in the areas that are not as strong.

There are specific rules for giving feedback properly and effectively. Refer to the **Small-Scale Marine Fisheries Training Manual** (available through ICE), Session 4, entitled "Feedback and Journal Writing" for some excellent guidelines.

The logistical conditions for the personal interviews are very important. They should be held in a comfortable, private location that is conducive to an open discussion. This is a time when both the trainee and the staff members must give their undivided attention to the trainee being interviewed and to what is being discussed, so if there is a chance that any party may be distracted due to other pressing issues, it may be best to reschedule the interview. Because interviews are so individual in nature, it is difficult to set rigid time frames. Flexibility should be built into the scheduling.

The first personal interview, which is usually shorter than the later interviews, takes place as early as possible during the first few days of training. Since this occurs before trainees have really participated in many activities, feedback is very rarely provided by the staff at this interview unless extreme behaviors have been observed or the trainee requests feedback on specific points. The first interview serves more to allow a personal contact to be made between the staff and each trainee, to welcome each trainee individually into the program, and to allow the trainees to ask questions or express any concerns they may have.

Pond Interviews and Quizzes:

Once trainees begin management of their ponds, trainers conduct informal pond interviews on a daily basis. Staff circulate around the pond area and spend time talking with the trainees about their activities, observations and problems they encounter. In addition to the informal interaction at the ponds, formal pond interviews are very helpful for checking trainees' technical comprehension and evaluating how well they are able to apply what they have learned. In addition, these interviews often help the trainee pinpoint aspects of their management that need further thought. If possible, they should take place approximately once a week. They are carefully structured. The staff decides upon a series of questions (usually between five and eight questions) to ask the trainees about their pond work. The trainers are each assigned certain trainees to interview. The trainers have a form for each trainee that has the trainee's name and the date at the top, followed by the questions, with spaces between the questions for noting the trainees' responses and other observations. The interviews take place during the normal pond time. Trainers, carrying clipboards with the forms, approach each trainee to whom they have been assigned. At the trainee's pond, the trainer explains that several questions will be posed about his/her pond. (The point here is to establish that this is a more formal visit than the usual pond time discussions). The trainer asks the trainee the questions listed on the form and notes down the trainee's responses as well as other significant observations (for example, the trainer might note that the trainee knew a great deal of the information without looking in his/her notebook, or that the trainee seemed eager to discuss his/her pond work in depth, or that the trainee had extremely disorganized notes and was unable to find information requested, etc.). Specific questions for pond interviews will be listed in the Program Design chapters.

Quizzes are given periodically and serve several functions. In some cases, they serve mainly to alert the trainees to their accountability for the material and the importance of taking careful notes and paying close attention to what they see, hear and learn. Sometimes they serve to help both the staff and the trainees to determine which aspects of the material are clear and well understood and which aspects need further attention. Quizzes are generally unannounced. They are usually open-book; trainees are permitted to refer to their notebooks during the quiz. Samples of some quizzes given in this program are included in the manual, but quizzes should be developed and given as required for each training situation.

Administrative Procedure - Separations and Resignations:

If trainees leave the program it is through one of three procedures: medical separation, administrative separation or resignation.

Medical separations are decided upon strictly by the Peace Corps medical officers and training staff are not involved except to fill out the necessary paperwork and carry out appropriate procedures related to the trainees physical departure from the program.

Trainees may choose to resign from the program for any number of reasons. In some cases, there are situations with family or friends that demand their attention or they simply arrive at the realization that they do not want to leave home at that time for personal reasons. Sometimes, they do want to be Peace Corps Volunteers but realize that they would prefer to serve in some program other than aquaculture. In some cases, a trainee may choose to resign as an alternative to being administratively separated. There are many more possibilities, but these are the most common.

If a trainee expresses a wish to resign, it is important for the Master Trainer to meet with the individual. If the trainee does not wish to divulge the reasons for the decision, he/she should not be pressured, but the staff should encourage the trainee to discuss his/her reasons for resignation. This is important for several reasons and the role of the staff at this point depends upon the trainee's reasons for resigning and on the trainee's needs and feelings at the time. The important thing is that every effort should be made to minimize the pain and discomfort of a trainee in this difficult situation, and to help this individual sort out personal feelings, allowing the trainee to make this decision with confidence and self-esteem intact. Sometimes, the trainee may be going through a period of low self-confidence and feel that it is best to leave even though he/she may not really want to resign at all. In this case, the staff may be able to help the trainee put unrealistic concerns into perspective and/or convince the trainee to wait awhile and offer to work with him/her more closely on some of the difficulties being encountered. In some cases, the trainee might be resigning because he/she does not enjoy aquaculture, but may be unaware of the possibility of serving in Peace Corps in another program. If it is determined through talking with the trainee that the individual does wish to join Peace Corps, the staff can offer suggestions for seeking out those other options.

Often the staff may agree that the trainee is making the right decision (for whatever reason), but the trainee still needs to be reassured that resigning from the program is not a negative thing. Sometimes trainees perceive themselves or fear that others will see them as failures or "quitters". They may fear embarrassment upon returning home after saying goodbye to their family and friends, or believe that people will be disappointed in them. Frequently, a trainee wants to resign but has not reached the point of being able to admit it out loud for the reasons just mentioned. So in a sense, the trainee may need to be given "permission" to leave. The staff should point out that it takes a tremendous amount of self-awareness, courage and sense of responsibility to make such a difficult decision. It is harmful to the trainee, Peace Corps, other Volunteers and host-country farmers to have a Volunteer go to post without really wanting to be there or without being fully committed to the program. It is much better to have the trainee resign during training than to wait until he/she arrives at post. Point out that sometimes Peace Corps is just not a good choice for a person, sometimes the timing isn't quite right, and/or sometimes the aquaculture program is not the best match for a person's skills and interests.

In the case of an administrative separation, there is a very specific set of procedures that must be followed to protect and ensure fairness to the trainee and to the training program. It is strongly recommended that the contractor for the training program be assertive and persistent in obtaining specific information about these procedures and all requirements of the office of Special Volunteer Services in Peace Corps/Washington. Refer to **Peace Corps Manual**, Section 284. The entire set of procedures will not be covered here in detail, but some of the major points will be discussed. Except in the most extreme cases, such as a trainee breaking a law or exhibiting extraordinarily bizarre behavior, administrative separation should be a last resort. Every effort should be made to provide helpful feedback to trainees regarding their progress in all aspects of the training criteria and to help them work on any areas needing improvement to bring them up to standards.

Trainees should be kept well informed of their progress. They should be given opportunities to respond to concerns expressed by the staff, and their responses should be listened to with objectivity and an open mind. Sometimes there may be misinterpretations on the part of the staff or the trainee that can perpetuate further misunderstandings and reduce the productivity of discussions between them. An honest, open dialogue can sometimes clear up the misunderstanding, open up communications and reestablish trust so that the issues can be addressed constructively. Feedback is critical in that trainees may be completely unaware of a problem, and thus may not be taking steps to correct it. No administrative separation should ever come as a surprise to the trainee. If proper feedback has been provided, if the trainee has been kept abreast of his/her progress and of the concerns of the staff, if the staff has helped the trainee develop strategies to improve problem areas, and if the staff and the trainee have agreed upon a set of conditions under which the trainee would be permitted to remain in the program, then the trainee will be well aware of where he/she stands and will have the opportunity to determine the outcome by his/her own actions.

It is worth repeating the importance of documentation of behavioral data and trainee progress. Part of the procedure for administrative separation involves thoroughly documenting the suggested grounds for separation, providing a chronology of what occurred to lead to the recommendation for separation, and explaining what was done to help the trainee correct the cited problems.

CHAPTER SIX

STAFF QUALIFICATIONS, STAFFING PATTERN AND STAFF TRAINING

Staff Qualifications and Staffing Pattern:

- The staff should consist of a Program Director, Master Trainer, Site Administrator and several Technical Trainers;

- All technical training staff members must be RPCV's who served in aquaculture programs and are recommended by their Peace Corps supervisors (usually APCD's);

- It is preferred that staff members be RPCV's from the countries to which the trainees are assigned and/or have served in countries with strong fisheries programs;

- It is also recommended that staff participated in a training program which used methods similar to those used in this program so that they will have a better understanding of the program, as well as a sense of confidence in the method;

- Staff members should be screened for certain personal qualities including but not limited to technical competence. Other important qualities include maturity, sensitivity, integrity, honesty, good communication and interpersonal skills, self-motivation, open-mindedness, ability to work effectively under pressure, stamina, initiative, organization skills and creativity;

- Although each staff member will have particular strengths and weaknesses, the staff as a team should complement one another in terms of their skills and personalities and be able to work effectively as a team;

- A real question has always been whether or not staff should be permitted to work several consecutive cycles. There are obvious advantages of having experienced staff, and of having staff members who have worked together and understand each other. Training is as much a learning experience for staff as it is for trainees and it takes experience to develop good techniques and gain confidence. Staff members who have been at the site for a while establish relationships with local resource people and members of the community, and are familiar with the area. The disadvantages of having repeat staff are "burnout", the possibility of falling into routines that exclude the kinds of creativity and new ideas that can come with "new blood", and personality conflicts as staff members become too used to each other, begin to have ego battles, etc. Rather than attempt to make a rule or quantify how much is too much for a trainer, this should be dealt with on an individual basis. If and when new staff is brought in, it is definitely preferable to maintain some experienced staff as well. A truly ideal situation would be to have a permanent training staff, but this could only work for an extended period if staff could have ample personal time, rest and privacy to maintain their energy level and enthusiasm.

- It is difficult to place an exact correct figure on trainer to trainee ratio. Quite simply, the more trainers the better, if they work well together. One trainer per five trainees is a good ratio for most situations. One trainer per seven trainees is the minimum for sufficient individual attention. These ratios do not include the Program Director, Master Trainer or Site Administrator. In making the decision on staff to trainee ratio, take into consideration the additional duties and stresses with which the trainers will be dealing. Factors to consider include the quality and quantity of administrative and clerical support (how many of the administrative tasks will fall on the trainers?), the logistics of the site (if housing, meal facilities and work-site are not walking distance from one another, trainers must spend much more time driving; there may be peculiarities that demand more of the trainers' time, such as equipment that can only be operated by staff or restrictions on facility use that prohibit certain responsibilities from being turned over to trainees; a lot of travelling and time may be necessary to obtain resource materials for pond management or to provide for trainees' personal needs) and the training experience of the staff;

Staff Training:
Staff training is critical! The quality of the staff and their level of expertise as trainers (not just as aquaculture Volunteers) have a major impact on the training. Without effective preparation, the staff is only a collection of individuals. Staff training orients the group toward a uniformity of purpose and approach. The staff training described here consists of only one week which should be considered a minimum. Realistically, this is not sufficient, especially with an inexperienced staff.

Sample Staff Training Schedule:
Monday
8:00 - 12:00

- Meet for staff orientation. Begin with informal introductions. Topics included in staff orientation are:
    - Formal introductions;
    - Staff training schedule;
    - Staff logistics (housing, meals, vehicle use, mail);
    - Program history;
    - Training philosophy
    - Training methodology/goals;
    - Experiential learning cycle and Peace Corps and the role of the trainer in experientially-based training.
- Share and discuss Trainers' expectations of training. This is a structured session in which Trainers are asked to write down their expectations, then share them with the group. The Project Director and Master Trainer address some of the expectations Trainers express, indicating whether or not they are likely to be met during the program.

1:00 - 4:00

- Discussion of trainer/trainee interactions (a list of topics to be addressed in this discussion is included later in this chapter);
- Project Director discusses rules and accountability of staff;

- The Project Director and Master Trainer discuss staff duties, including general staff duties as well as supplemental staff duties. Trainers are encouraged to think about which supplemental duties they would prefer, and to inform the Master Trainer of any of those duties to which they feel they would be especially well suited;
- Assign plans to be written by Trainers for Wednesday morning meeting. Each Trainer is assigned one plan, so that at least one stocking plan, feeding plan, and fertilization plan is included.

4:00 - 6:00

- Trainers tour area around training site, take care of personal errands, meet members of community (doctor, vendors, restaurants, laundry etc.).

Evening

- Team Building. This involves a social event such as meeting for dinner or at a staff member's home.

Tuesday

8:00 - 12:00

- Staff meet to discuss, make a list and assign site preparation tasks which need to be completed before the arrival of the trainees. (Repeat Trainers are can provide helpful input);
- Work on site preparation, vehicles, sheds, etc.;
- Get familiarized with maintenance and operation of pumps, ponds, etc.

1:00 - 3:00

- Trainers meet individually with Master Trainer to discuss concerns, preferences for supplemental duties, etc.;
- Continue site preparation.

3:00 - 6:00

- The Master Trainer presents a brief overview of the training schedule;
- Discussion of training methods;
- The Master Trainer assigns supplemental staff duties and explains how these are divided among the staff members. Each Trainer, as well as the Site Administrator, should receive a copy of the supplemental staff duties and should be informed of which Trainer is responsible for each set of duties;
- Planning for Wednesday.

Wednesday

8:00 - 10:00

- Discussion of the assessment component of training;
- The Master Trainer gives each Trainer a copy of behavioral indicators for the assessment dimensions used in the program. The staff goes through the indicators as a group to familiarize the Trainers with them and clarify points as necessary. The Master Trainer and repeat Trainers, if any, provide examples when possible based on past experiences;
- Case studies are presented to illustrate how assessment works and the administrative procedures that are followed. Role plays are used to help demonstrate these topics;
- Collecting behavioral data. The Project Director and Master Trainer define behavioral data, describe how it is collected and what can be done to maximize its usefulness;

- The purpose, format and contents of personal interviews are presented to the staff. Role plays are used to help illustrate the points that are raised.
- The Orientation schedule is discussed, and individual Trainer roles for Orientation are defined;
- The Master Trainer presents an overview of the schedule for the first week of training;
- The purposes and designs of the Expectations and Individual Focusing sessions are discussed.

10:00 - 12:00

- Pond Observations. Staff members are given similar instructions to those which will be given to the trainees, and they do this exercise essentially the same as the trainees will be required to do it;
- Discuss the Pond Observation exercise as it will be implemented with the trainees.

1:00 - 2:00

- Trainers meet with the Site Administrator regarding office, purchasing and medical procedures.

2:00 - 4:00

- Discuss the set of Management Plans that trainees will be required to write. Practice (role play), using plans the Trainers have written, the one-on-one training techniques that will be used to guide trainees through the plans;
- Discuss the approach and goals for the management plans;
- Discuss the content of the individual components of the plans (i.e., pond preparation, stocking, feeding, fertilization, etc.);
- A list of the technical concepts to be covered in the management plans is distributed and the concepts are discussed to ensure that all staff members have a clear and consistent understanding and interpretation of each point;
- Discuss the techniques used and the Trainer role during the development of management plans.

4:00 - 6:00

- Individual work on set-up of site;
- Individual meetings with Master Trainer as needed to discuss details of supplemental duties or other issues.

Evening

- Continue to practice training techniques used for management plans using role plays, critiques of techniques used in role plays, sharing of ideas;
- Staff members read trainees' Pre-Training Questionnaires.

Thursday

8:00 - 10:00

- Discuss first week of training in detail;
- Discuss trainer role assignments during training and Orientation;
- Further discussion of trainer/trainee interactions;
- Discuss staff interactions and communication.

10:00 - 12:00

- Practice training techniques for management plans.

1:00 - 3:30
- Trainers take a tour of the ponds and other facilities with experienced staff or others familiar with the site.

3:30 - 6:00
- Staff uses role plays to practice for Individual Focusing session.

Evening
- Review Peace Corps policies in preparation for Orientation.

Friday

8:00 - 12:00
- Detailed review of all procedures and individual roles for the day trainees arrive. This includes airport procedures, lodging arrangements, meals, etc.;
- Detailed review of logistics, design, staff roles and special considerations for the first week of training;
- Practice techniques for management plans;
- Discussion of any remaining "burning issues".

1:00 - 6:00
- Final preparations of site;
- Preparation of housing facility;
- Prepare newsprint and posters for Orientation and airport;
- Collect all materials necessary for Orientation.

Saturday
- All day - trainees arrive.

Staff/Trainee Interaction Topics:
- Relationships (sexual relationships or otherwise inappropriate relationships);
- Macho/hazing mentality;
- Vulnerability of trainees;
- Respect, basic good manners;
- Objectivity, consistency with trainees;
- Acknowledgement that staff has to adhere to program guidelines;
- Within program policies, be yourself when interacting with trainees;
- Not taking things personally (when trainees are under stress, the staff often bears the brunt of their frustration);
- Trainees expect trainers to be super-human (do not show irritation, moodiness, etc.);
- Encouragement;
- Honesty;
- Setting example/role models (staff are under constant scrutiny to practice what we preach;
- Use of humor (what is and is not appropriate);
- Fallibility of staff, integrity with trainees
- Parent mentality, patronizing attitude;
- Promote cooperative atmosphere between staff and trainees.

Staff Interaction Topics:

- Staff members support each other;
- Demonstrate respect for trainees when speaking with other staff members;
- Sensitivity to moods, fatigue, vulnerability;
- Watch timing of feedback, jokes, questions, etc.;
- Feedback among staff;
- Open communication;
- Do not interpret for each other;
- Consistency with trainees;
- Let each person do his/her job without interference;
- Do your own job without being reminded;
- Take time off when you can, when you need it;
- Any interaction that involves possible negative feelings, changes to facilities, or precedent-setting decisions needs to be brought up to the senior staff, and the final decision lies with the Training Director/Master Trainer or Project Director;
- In general, staff meetings are not optional;
- Do not make a mountain out of a mole hill, keep a balanced perspective;
- Be aware of how staff moods affect overall tone of the program and trainees;
- Set clear priorities that are consistent with those of other staff members.

Supplemental staff duties:

In addition to their work as trainers and facilitators, staff members have many other responsibilities including logistical support and making sure all systems are in place for training to proceed smoothly and trainees' needs to be met. The tasks and duties that are foreseeable should be listed and then broken down into a set of duties for each staff member. The actual duties and how they are broken down depends on the specific site situation and logistics, staffing patterns, experience of the staff members and personal preference. The following lists provide a sample of how duties could be broken-down based on a staff of four technical trainers. Additional duties are listed at the end. These duties can be assigned once training is in progress and based upon the work loads each Trainer at particular points in the program when those activities need to be implemented:

Vehicles and Pumps:

- Keep inspections/registrations updated;
- Implement weekly maintenance schedule (gas, oil, water, air,fluids, belts, etc.);
- Special maintenance based on weekly checks (i.e. lights, blinders, general running condition, etc.). Set up system with rest of staff so that any vehicle problems are reported to you;
- Repairs (if we cannot do them ourselves, locate best place to have work done, get prices, get vehicle repaired. Work with Site Administrator on this.);
- Responsible for meeting administrative requirements regarding vehicle use (i.e. reporting of mileage, use of logs, turning in and picking up vehicles, etc.);
- Keep vehicles clean. Get trainees to help with this;
- Keep staff informed of any vehicle problems;
- Keep staff informed of procedures for filling out logs, gas receipts, etc.;

- Coordinate use of vehicles. Tell other staff which vehicle to use for which activities. Know where all vehicles are at any given time. You may want to post something on schedule board if vehicle use could get complicated at some points. This gets especially complicated when trainees want to come early or stay late;
- Be sure there is a duplicate key in the office for each vehicle;
- Make sure each vehicle has a first aid kit, flashlight and anything else you think is important (basic tools, tire gauge, etc.);
- Report any new dents, broken mirrors, scratches, etc. to Site Administrator immediately;
- Set up system for early/late pond management activities by trainees:
    - Set up policy for trainees to sign up for early or late runs;
    - Keep list of who comes early/stays late;
    - Coordinate staff and vehicles for these runs;
    - Be sure meal staff is informed;
- Take charge of all pumping into ponds. Teach trainees to use the pumps properly and to fill out the log, etc.;
- If using portable pumps, make sure gas and oil are on-hand as needed. Teach trainees to use any of this sort of equipment properly.

Reports/Quizzes/Special Assignments:

- The main function of the reports is to get information on each trainee's pond work and level of understanding. The secondary function is to have them improve their report writing skills;
- Develop a form for the trainee files in which information from the reports is synthesized (e.g. number of water quality samples taken). Inform staff of weaknesses in any trainee's performance or understanding of concepts;
- Keep track of all assignments handed in. Be sure to know who handed them in, who handed them in on time or late, who is missing assignments. Use checklists. Have all assignments come through your hands so you can do this in an organized and accurate fashion;
- Know exactly what assignments are given, and know the exact wording of every assignment and quiz. Check schedule and be sure to be at sessions where assignments are given;
- Set up files in filing cabinet for the corrected reports and other assignments and quizzes. These will be kept in the office until the end of training.
- Work with Master Trainer to determine exactly what criteria and standards are to be used for each assignment. Make sure that the rest of the staff is made aware of these in order to ensure consistency in the way the work is reviewed and the kinds of comments that are made;
- Make sure that all work is read and commented on. You do not have to do it all, but devise a system for splitting this work up among the Trainers. You are responsible for that and for making sure comments are consistent. You should look at all of the work before it is returned to the trainees;
- Meet with trainees to introduce reports and facilitate a discussion in which the criteria are clearly set out. After the first report, have the trainee group set the format. Make it clear that the training staff is the audience;

- Let Master Trainer know when a meeting with the trainees is needed to discuss particular reports or other assignments. For example, if the majority of trainees missed the point of a particular assignment, if everyone did poorly on a certain quiz, if everyone did a great job on a homework assignment, etc.;
- Make sure trainees' notebooks are checked periodically;
- "The Big Board". This is a very large sketch of the ponds to be posted in the office. This is to be used for keeping track of what's going on in the ponds at all times. All staff members should participate in keeping this updated, but you oversee the system. Information on this chart should include what fish are in each pond, weight/number, feed, fertilizer, "contraptions" built by trainees, compost heaps, etc. Much of this can be gleaned from weekly reports;
- During the first week or two, help with requisitions and equipment distribution at sheds.

Assessment Files, Logistics:

- Set up behavioral data files in office;.
- Control quality of assessment data that is put in files. This includes being sure data is objective, has a date, and is in an understandable context;
- Notify staff of trainees for whom data is not being collected, critical or potentially dangerous problems, etc.;
- Devise useable, simple, realistic systems for collecting and organizing behavioral data;
- Keep files organized, in chronological order and divided into topics;
- Set up file such that data used for an interview is set apart from other data;
- Be sure files contain contents and dates of interviews;
- Be prepared to present assessment data that pinpoints problem areas and act as a catalyst for collection of assessment data by all staff members whenever appropriate, especially for staff meetings;
- Set up, post and notify Trainers of rotation system for seeing trainees at ponds;
- When changes in schedule are made or special events come up, be responsible for making sure trainees are informed as well as staff;
- Make sure all necessary materials are brought to class sessions (i.e. projector, screen, newsprint, markers, tape, handouts, etc.);
- Remind Master Trainer regarding upcoming activities and anticipate needs for those activities (coordinate with inventory person). For example, if you know we are going to teach net repair next week, make sure we have twine and shuttles in the office in time;
- Point out when tasks need to be assigned to be sure everything is covered;
- Help set up local field trips, resource people. Again, this will involve helping anticipate the needs in advance;
- When setting up these trips or resource people, be sure to set up very clear appointments, get exact directions, and try to talk with the actual person with whom we will be dealing;
- Make sure thank you notes are written and sent after all trips and visits to or by resource people;
- Set up schedule to distribute trainees' money (walk-around and weekend):

    - Distribute checks, be sure trainees sign for them and be sure they know what each check is for;
    - Get checks back, signed and with appropriate identification so they can be cashed, or make whatever arrangements are necessary for getting them cashed;
- Set up system to collect trainees' outgoing mail and be sure it gets to office in the morning. Set up system for trainees to be able to purchase stamps;
- Be sure incoming trainee mail is taken at end of day and distributed;
- Coordinate all fish movements:
    - Tell trainees where to get their fish for stocking or for special needs such as seminar demonstrations, marketing, fish fry, etc.;
    - Tell them where to put fish when they need to move any;
    - Keep records of all fish movements so that we know the origin of fish in any pond;
    - Work with trainee crews for stocking and harvesting crew at end of cycle;
    - Keep records of all fish storage, fish inventory. Know where all fish are at all times, as well as the quantity of fish in any pond at any time.

Feed Room and Equipment Shed Inventory/Pond Area Maintenance:

- Sit down with Site Administrator and review the details on purchasing procedures, ordering, receiving, etc.;
- Keep inventory records for equipment sheds and check condition of all tools. Make sure inventory is done before trainees come. Early in the program, you will be the key person in charge of the requisition system. Other Trainers will assist you, but you set the rules and procedures. When the trainees get access to the sheds, have them work out a rotating system of responsibility. They will then need to do weekly inventories and inspections and report to you in writing;
- Note: if we need more tools or equipment and make sure broken equipment is repaired or replaced;
- Maintain stock of "consumables" such as fish feed, fertilizer, grass seed, rotenone, lime and manure;
- As training progresses, anticipate needs for upcoming projects and make sure all necessary items are on hand when needed. For example, if we are going to begin masonry in two weeks, make sure we've ordered our cement, sand and gravel;
- Set up efficient system to be used among staff members for keeping track of purchases that need to be made and those that have already been made so that necessary items are purchased as soon as possible but duplicates are not bought, and extra trips to town do not have to be made. One suggestion is to put a blackboard or other recording system in the office that can serve as a quick reference and is easy to update;
- Be sure the bathroom at the ponds is clean and in working order, and keep it supplied with light bulbs, toilet paper, paper towels and soap;
- Supervise trainees responsible for keeping feed room and coop clean and organized;
- Check up on general condition and appearance around pond area (includes holding tanks and buildings);
- Work as needed with appropriate Trainer regarding use, maintenance and repair of pumps;

- Do occasional checks on water quality in water supply system for staff information.

Office Storeroom Inventory, Classroom Area, Feed Shed, Storage and Pond Area:
- Work very closely with equipment inventory person to coordinate all inventory and purchases, and also to organize distribution of tools and materials to trainees. This will be especially important during the early weeks when the requisition system is in effect. You two will need to split up duties at the tool and feed sheds during that time;
- Be completely familiar with all pumps (main supply pump,holding tanks, portable pump) and with their use and maintenance. Work with appropriate Trainer on this;
- Keep inventory of office storage room and pantry area.Make sure inventory is done before trainees come. Distribute materials from these rooms as needed;
- Distribute appropriate materials to trainees at specified time and keep track of what they receive. You are responsible for having them sign a sheet saying they have received the equipment. Be sure these are filed properly. Again, make sure we have what we need ahead of time. This is in reference to things they take overseas with them: pH kits, netting materials, hand levels, spring scales, books, etc. Work with Master Trainer regarding when to give things out;
- Set up a system so that notebook paper, pens, stapler, etc. are always available to trainees. Also, supplies for seminars and special assignments should be made available;
- Keep tabs on up-keep and condition of classrooms;
- Set up coffee pot in classroom. Once it's there, it's the trainees' responsibility. Keep up supply of coffee and filters;
- Be sure the bathroom at the classroom is clean and in working order, and keep supplied with light bulbs, toilet paper, paper towels and soap;
- During seminar preparation week, be responsible for set-up and upkeep of library. Includes doing an inventory of all library materials before and after training. Supervise trainees responsible for care of library during seminar preparation week;
- Contact person with meal staff. Notify appropriate coordinator of changes in meal times or numbers. Be sure coolers ready for lunch people and work with trainees to keep coolers clean. Supply drinks for trainees;
- Contact person with housing staff. Be sure trainees are responsible for conditions and behavior at lodging. Notify management of any damage or problems, and encourage them to notify you of any problems from their perspective. Also, check rooms prior to arrival of trainees and make note of any damage or excessive wear. Put trainees' names on doors. Hand out keys and discuss any ground rules regarding lodging facility with trainees;
- Take charge of fish fry events. Work closely with designated trainee group coordinators to provide necessary support, supplies and transportation. Also, oversee care of cooking facilities and any other areas used for fish fry.

Additional special duties to be assigned:
- Coordinate surveying exercises;
- Coordinate site selection/site development, pond design exercises;
- Coordinate masonry project;
- Coordinate wheelbarrow project;

- Coordinate fish marketing project;
- Teach certain skills during seminars such as net hanging and repair and PVC pipe bending;
- Set up and coordinate long field trip.

Staff meetings:
Since training is both dynamic and logistically complicated, and requires that the progress of a large number of trainees be very closely tracked, staff communication is critical to ensure a smoothly running and effective program. Trainers are so busy that one of the most important ways to ensure communication is through frequent, mandatory staff meetings. Staff meetings can be difficult to arrange because the schedule in training is so tight and often staff members have made plans to meet with trainees even during unstructured hours. Staff meetings impose another burden on Trainers' time, and sometimes there is some feeling of resentment when evenings, lunch breaks and any other available blocks of time have to be used for staff meetings. There is no real solution to this problem, yet staff meetings must be made a priority and presence by all staff members should be mandatory in most cases. This must be made clear during staff training. While it is impossible to avoid having to have frequent staff meetings, a tremendous amount of time can be saved and stress minimized by structuring staff meetings so that the time is used efficiently. This is more difficult than it may sound, so serious consideration should be given to setting a precedent for staff meetings right from the beginning of the program.

Some suggestions and guidelines for efficient staff meetings include:

- The Master Trainer (or other staff member who is going to run the meeting) should come with a prepared agenda. The agenda and estimated length of the meeting should be announced at beginning. Ask if there are items that others would like to add to the agenda;
- The meeting should follow the agenda. After each item, the lead person should ask for comments or questions, and ask whether that item has been covered to everyone's satisfaction. Do not interrupt the meeting to discuss a subject out of order of the agenda;
- The person who is responsible for a particular duty should be allowed to do the assigned job. Suggestions should be offered only after hearing out that person completely. If there are suggestions regarding someone else's job, they should be offered politely, sensitively and with consideration for timing (i.e. it is not helpful to offer a suggestion for a radical change five minutes before a carefully planned activity is to be implemented, for this only causes stress for the person in charge of that activity. In a case like this, hold the suggestion and incorporate it next time a similar activity is planned or in a future training cycle);
- When going over an upcoming activity or session, listen carefully, and allow the person responsible to go over the entire plan without interruption. Jot ideas down, and then, when finished, the speaker should open up the floor for discussion, suggestions, comments and questions;
- The importance of listening attentively and carefully, and of not interrupting, cannot be overstated. It is extremely disruptive and unproductive to have to repeat things or have someone continually jump ahead in the agenda. While good suggestions are

appreciated, the manner and timing of their delivery will affect how they are received.

Staff Evaluation:
Staff members are under stress and are as concerned about how they are doing their jobs as are the trainees. Feedback among staff members is important and usually appreciated. With so many other things to be concerned about, staff evaluation and feedback tend to be one of the first things to be overlooked or put off. The Master Trainer should take the responsibility of making sure that occasional interviews are scheduled with each staff member to provide and receive feedback, and to address any questions or concerns each Trainer may wish to discuss. Feedback between staff members should be handled similarly to the way it is with trainees, and the same rules apply. Any rules or specific grounds for which a Trainer could be dismissed should be clearly stated during the early part of staff training. A few suggestions for grounds for dismissal include inappropriate relationships with trainees, unsafe driving or failure to uphold professional standards that are required of the trainees.

Recommendations regarding issues that should be addressed in staff evaluation include:
- The level of professionalism a Trainer demonstrates, and how well that staff member models the qualities trainees are being urged to develop;
- Specific training skills and techniques effectiveness, attitude, style and creativity;
- Degree to which the Trainer is up-holding all responsibilities for both training and for supplemental duties;
- Ability to work effectively with other staff members and be a cooperative member of a team.

Note on Staff Hiring:
The job of a trainer is an extremely difficult one. Lack of privacy, extraordinarily long hours and heavy work loads, constant responsibility for trainees progress and personal needs, and the stress of training itself demand an unusually high level of commitment. Before accepting a position as a trainer, potential staff members should be well informed of the realities of the job. In addition to being fair to the trainers, advance warning will also minimize problems that could arise during the program if trainers do not have a clear understanding of what they can expect.

General Trainer Notes for Staff Training:
- Emphasize that trainers are facilitators rather than instructors. They help trainees not only to arrive at solutions but also to develop their problem-solving skills and abilities;
- Trainers themselves must understand different approaches to problem-solving and must be skilled in the use of a variety of tools and techniques. Do some practice problem solving during staff training just to ensure that all trainers have these skills. This is not role playing and should be geared towards developing the specific techniques that staff will then teach to trainees. In addition, teaching techniques for working with trainees should also be developed;

- Staff members should do as much role-playing as possible to practice the individual, one-on-one, questioning technique that is used in training. Once training is underway, staff should continue to compare experiences, problems and suggestions for new or improved techniques;
- There are numerous problem-solving techniques. Some of the techniques we use the most include:

  - **Brainstorming:** All ideas, possibilities, solutions and explanations are considered without judgement. Once every idea has been written down (or verbalized), each one can be more closely examined and a process of elimination can occur.
    Example: What are all of the characteristics that would be desirable in a fish to be raised in a pond? A fish that grows to exactly the size people want to buy in very little time, a fish that tastes good, a fish that has no bones to worry about when you eat it, a fish that never gets sick or dies, a fish that is easy to catch in a net, a fish that does not need much oxygen to live, a fish that can grow in very crowded conditions, a fish that can grow well on almost no food, a fish that eats food that is free, a fish that people always want to buy, a fish that can grow in any weather and conditions, a fish that has no scales to remove, a fish that reproduces so easily that you always have enough to start again, a fish that will not eat its own offspring, a fish that is attractive, a fish that has no sharp teeth or spines to hurt you when you pick it up;

  - **Analogies:** This involves relating an unknown to a known, or putting a problem into a more familiar context; this may be to help clarify the exact question, define the problem, or find some foothold, reference point or strategy from which to work towards a solution.
    Example: If one is trying to determine the proper stocking rate for a fish pond but has never worked with fish at all, choose something more familiar to start that may involve some similar principles. If one were planning to grow cows in a field or plant a garden of pumpkins, what would one have to take into account in determining how many calves to put out in the field or how many pumpkin seeds to plant. How do farmers determine this? What stocking or planting rates would they use for these other crops in an area the size of this pond? This leads to thinking about what factors must be considered, what the constraints are, what a living thing needs to grow in a particular amount of space, what happens if too many or too few are planted or stocked. All of these concepts relate directly to stocking a fish pond, and use of an analogy can even help find a starting point in terms of actual numbers in the absence of any other information. Once a starting point has been found, comparisons can be made between the analogous situation and the real situation at hand so that modifications or adjustments can be made as deemed appropriate (e.g. what are the differences between pumpkins and fish that might affect their requirements for growth?);

- **Determining personal biases/changing perspectives:**
Example: When observing a new area, what do you look at first and what kinds of things do you see? If you were a botanist instead of a zoologist, or if you were a plumber instead of a biologist, what would you be seeing?;

- **Listing questions instead of answers:** This serves as a starting point and helps define the problem. It can be followed by brainstorming answers to each question.
Example: To begin work on a feeding plan, start with questions that will need to be addressed. What do fish need from their food? What foodstuffs might provide those nutrients? What foods are available? What do fish consider to be "food" and what do they like to eat? How much do fish need to eat? What happens to the food after the fish eat it? How does food make fish grow? How much can or should the fish grow? What happens to the food the fish don't eat? When do fish eat the most? How many times per day do they eat? Where do they like to eat in the pond? How should the food be given to them? What form should the food be in?;

- **Simplification of a problem:** This can mean listing questions as described above in order to break a problem down into smaller parts, or it can involve eliminating interfering details and side issues in order to focus on one well-defined problem at a time. Simplifying a problem can break the inertia that can come with the fear attached to dealing with many complicated factors at once.
Example: If feeling overwhelmed and confused when laying out a pond to be constructed, temporarily eliminate all confusing, detailed information that has been learned and get back to the simple, basic, bottom line characteristics of a functional fish pond. It must be able to fill with water, it must be able to hold water, and it must be able to drain completely. Thus, the water source must be higher than the pond, the soil must be able to hold water, the pond bottom must have some slope, the drain must be in the lowest point in the pond, and there must be a drainage area that is at a lower elevation than the pond bottom. That is a clear set of ground rules from which a plan of action can be developed, and once action begins, the other details will probably fall into place as the need for them arises;

- **Use of exaggerated solutions to define important factors:**
Example: What would happen if I stocked one fish in the pond? What would happen if I stocked a billion fish in the pond?;

- **Visualization, putting something into a form that can be visualized:**
Example: On stocking plans, break down a carrying capacity that is being considered to something that can be visualized. If it is impossible to determine what a figure like 3000 pounds per acre really says, break it down to its equivalent on a per square foot basis, i.e. approximately one ounce per square foot. Draw a one square foot area in the dirt and put in something that approximates a one ounce fish. Does this look feasible?;

  - **"Zooming in and out" or "narrowing and broadening perspective":** Alternate between looking at something in terms of a big interrelated system and the details or individual components that comprise it.
    Example: In trying to figure out how a water supply system works, look at the arrangement of all the ponds, the general topography of the land, and the location of the water source. Then look at exactly how and where the water enters each pond, what the inlet structure is and how it functions, what it is attached to, etc. Switch back and forth between the broad and detailed views to help make the connections and find the relationships;

  - **Some other problem-solving approaches include:** Careful observation, deductive reasoning, educated guessing, trial and error, experimentation and use of physical models. There are many more. Approaches to solving problems are as numerous and diverse as the experiences and imaginations of the people involved;

- When working with trainees, trainers must listen carefully and pay very close attention to the trainee's own approach to a problem. Often the first thing a trainer can do is to simply help the trainee define the problem clearly;
- It takes sensitivity and good judgement on the part of the trainer to help the trainee choose the most appropriate approach to solving a problem. Encourage the trainee to tackle one problem at a time, and do not cause confusion by trying to introduce more than one approach at a time;
- The trainer should try to understand the trainee's own thought process so that guidance or input can be offered that is consistent with the way the trainee is thinking. Do not force a trainee to reason the way you do, try to understand the way he/she thinks;
- Trainers should remember that trainees are very vulnerable, especially early in training, during the one-on-one interactions with the trainers. Sometimes they feel that they are "missing the point" or can't figure out the "right" answer or that the trainer is going to lose patience with them. The trainer's job is to help them develop and recognize their abilities, not to tear down their confidence. Be careful not to devalue ideas trainees offer, no matter how unreasonable, illogical or incorrect they may seem to you. Remember that there is an element of risk taking in learning to brainstorm or to use other problem-solving techniques, especially in an unfamiliar subject area. Thus, trainers should be supportive and sensitive, and should be very aware of their own gestures, facial expressions and tone of voice to be sure they are not inadvertently demonstrating frustration, impatience or exasperation;
- If a trainer is becoming impatient or irritated, that individual should take a break. Excuse yourself temporarily, or give the trainee something to work on, and arrange to get back together after a specified amount of time;
- Avoid appearing smug. Remember that training is about developing the skills and processes for solving problems just as much as, if not more than, it is about knowing the best side slopes to put on a given dike. In many cases, there will not even be an actual "right answer". The process is more important than the content, and trainers should remember this. This is the basic premise of experiential skill training;
- Along similar lines, trainers sometimes get frustrated if trainees do not arrive at what the staff believe to be the best decision or solution. Here again, remember training is

a learning process, and making mistakes or trying different practices is more valuable than doing everything right the first time. Forcing a trainee to do something the way you want it done would have the same effect on the learning process as giving out technical information or advice: it would rob the trainee of a learning experience, of opportunities to develop his/her analytical and problem-solving skills, and finally, of the sense of accomplishment and confidence that comes with doing something on one's own;

- There are cases when a trainer simply cannot "connect" with a particular trainee. If, after trying a few different approaches, you feel that you just cannot communicate effectively with a certain trainee, discuss it with the master trainer so arrangements can be made to have that trainee work with a different trainer;
- Sometimes, while trying to solve a particularly challenging problem or when covering complicated concepts, even the Trainer can become temporarily confused. You owe it to the trainee, in this case, not to drag him or her along with you into a state of confusion. Again, excuse yourself in order to clear your thoughts. It is often best to admit to the trainee that you need to think about a point further before continuing;
- Be extremely cautious regarding honesty and clear messages. It is easy to say something without thinking that might be taken literally by the trainee. For example, do not say "I don't know, what do you think?" if you do know. Also, do not send the wrong message by unconsciously responding in a way that implies an affirmation of some idea or explanation that has been offered by a trainee when what you really mean is "Okay, that's one possibility, what's another?" (In other words, if a trainee, trying to determine how fish can live in the water at night when plants are not producing oxygen says, "Well, maybe fish don't need oxygen at all", and the Trainer absently says, "Uh huh", the trainee may interpret that to mean that fish don't need oxygen).

Pre-training Research:

This is critical! The thoroughness of the pre-training research can have major effects on the quality of training activities, efficiency, the credibility of the staff with trainees, and stress on the staff during the program.

- Staff must become very familiar with the training site. All staff members should have a thorough knowledge of the layout of the ponds, how they function, any peculiarities in any of the ponds, and any special inlet or drainage structures. They should be thoroughly familiar with any pumps, canal systems, dams or other features of the water supply system The same applies to holding tanks, equipment sheds and other facilities;

- If there are pumps, the staff should be well versed in their use, care and maintenance, basic repair, and where to get parts or get repair work done;

- Staff should do a thorough inventory and know exactly what they have on-site. This includes: Fish , technical equipment, tools, replacement supplies for chemical kits, spare parts for equipment and pumps, feeds, fertilizers, grass seeds, compost materials, construction materials, office and classroom supplies, etc. Regarding the fish, staff must know exactly what species, what size, what a ge and how many are in each pond;

- Staff should become familiar with surrounding areas on and near site. This includes areas that may be used for site selection exercises. Seek these out if they are not immediately obvious. Familiarity with topography, soil and vegetation is important;

- Staff should make a point of getting around the area and meeting as many people as possible, both on the site and in the surrounding areas. This includes support staff on the site (even if not involved in the training program, like grounds keepers, etc.), law enforcement people, local government officials and extensionists (especially in related areas such as department of agriculture, fisheries, natural resources, soil conservation, forestry, etc.), all staff at housing and meal facilities, local medical and health care workers, vendors in community (especially those with whom business will probably be conducted), vehicle maintenance service people, librarians, etc.;

- Staff should seek out and meet as many potential resource people as possible, i.e. farmers, researchers, experts in various fields (soils, construction, nutrition, fish disease, animal feeds, etc.) and identify potential sources of information or field trip destinations such as libraries, aquaculture facilities, feed mills, processing plants, net factories, vendors of aquaculture equipment, fish markets, etc.;

- Staff should familiarize themselves with all on-site resources, including books, reprints, journals, newsletters, etc. available in the training library. They should learn as much as possible about aquaculture practices in the area where the training is being conducted;

- Staff should learn about the concerns of local fish farmers, special problems or considerations, marketing conditions (demand, outlets, prices), species being raised, local water quality conditions, and so forth. In other words, be very well in touch with the status of the industry in the area, current events, and the kinds of activities going on that may be relevant;

- Staff must know their way around. They should know locations of the airport, hospital and other medical facilities, the Peace Corps office (if appropriate), the post office, stores, libraries, fisheries facilities, etc.;

- Staff should know as much as possible about the aquaculture programs in the countries to which trainees will be assigned.

CHAPTER SEVEN

TEN-WEEK PROGRAM: SUMMARY AND WEEKLY SCHEDULE OF EVENTS

Weekly Program Summary:

Week One - Orientation and Pond System Observations:

- The trainees and staff get acquainted and trainees become familiar with the local area, living quarters and basic logistics of training. Information is provided on the training program, logistics, rules and Peace Corps policies. Administrative forms are completed. Trainees' expectations of training are discussed. The training program objectives, design and methodology are related to volunteer effectiveness;

- Short interviews take place to allow staff to meet each trainee on an individual basis and to give trainees opportunities to express concerns, hopes or interests, and ask specific questions;

- Trainees sharpen their observation skills, become familiar with the training site, and begin to adjust to an individual style of learning through a detailed and thorough study of the pond system and surrounding area. They begin to learn and develop specific questions about aquaculture based on their observations;

- Each trainee is assigned a pond to manage throughout the training period. They define their goals for their pond work and begin writing work plans and preparing their ponds. In order to obtain equipment, trainees are required to follow a requisition system that is explained to them by a staff member;

- A special meeting is held to help trainees process what they experienced during the first week, and to help them see training more clearly in the context of their role as Peace Corps Volunteers. They are encouraged to think about their training from the perspective of Peace Corps and the host country, and to consider the needs they will be expected to meet as volunteers. The trainees are encouraged to define their goals for the ten-week program. They are informed of the staff's expectations of them during the program as well.

Week Two - Introduction to Pond Management:

- Trainees spend the week writing work plans and working in their ponds. Through the development of detailed, comprehensive Management Plans, basic technical and biological concepts of pond culture are explored, and trainees are encouraged to formulate additional questions related to their work. They begin to think of themselves as fish farmers, to view aquaculture as a form of agriculture and to recognize the importance of economics and profitability. Brainstorming and goal setting are introduced as problem solving techniques;

- Through pond preparation and stocking, trainees begin doing the physical tasks involved in aquaculture, working with various tools and equipment, using the pumps and associated plumbing, and handling fish. A meeting is held in which they can share their experiences and develop some guidelines regarding the proper handling of fish;

- At the end of the week, trainees are asked to evaluate the training program to date by means of a prepared form.

Week Three - Advanced Pond Management:

- The emphasis during this week is on pond management. At this point, trainees have developed the main sections of their management plans sufficiently that they are carrying out a variety of daily activities at their ponds, learning about fish and fish culture through experience. This will continue throughout the program as they continue to manage their ponds;

- Trainees have developed enough specific, clear questions about fish and aquaculture to take advantage of opportunities presented by access to resource people and visits to other facilities. Field trips are scheduled and trainees get hands-on experience working with fish culturists at nearby facilities. Trainees are expected to apply the information they gain to their own ponds;

- Trainees are made aware of the requirements for weekly technical pond reports in which they are to document all activities that occur with their individual ponds, report data they collect, their interpretation of that data, and plans for the following week. Professional record keeping and report writing becomes an increasingly important theme as training progresses;

- Responsibility for the maintenance of tools and feed sheds are turned over to the training group;

- Information gathering, professionalism and social awareness are stressed in their interactions with resource people and the community as a whole;

- Personal interviews are conducted with each trainee. In preparation for these interviews, trainees are asked to fill out a self-evaluation form. During the interview, the staff and the trainee compare notes on how each thinks the trainee is progressing in various aspects of training. If the staff or trainee feels it is appropriate, ideas are exchanged and suggestions are made on how improvements can be brought about in certain areas.

Week Four - Surveying and Masonry:

- Trainees are instructed in the use and care of surveying equipment. They are required to complete a series of exercises which reinforce the techniques and introduce the basics of pond design. One of the surveying projects is conducted in small groups, then presented to the large group in a formal setting. In addition to obtaining specific new technical skills and applying them in a variety of ways, the exercises permit trainees to sharpen their leadership skills and to practice working effectively in groups. The presentations give them an opportunity to develop their public speaking styles, share and reinforce the technical material they have learned, and serve as an introduction to extension techniques. Critiques following each presentation provide opportunities for giving and receiving feedback, while becoming familiar with the rules and guidelines for proper feedback;

- Trainees design a holding tank, monk or other concrete structure. Under the direction of group leaders, they build the form, set up the reinforcement and mix and pour the concrete;

- Trainees complete another evaluation of the training program;

- If possible, participation in a local festival or social event is scheduled.

Week Five - Advanced Site Selection and Pond Design:

- Trainees spend a day with an expert in site selection, pond design and pond construction from the Soil Conservation Service. They receive both classroom and field instruction, then participate in several exercises. For the rest of the week they work in small groups on a site development exercise, laying out a viable pond and presenting it to the group. Extension techniques are emphasized as a part of these presentations;

- Trainees are informed of their responsibilities for seminar presentations. For these presentations, the various aspects of fish culture and extension are organized into a series of seminar topics. Each trainee is assigned a topic to research and present to the group. If Marketing and Economics is not to be included among the seminar topics (this may depend on the size of the group, backgrounds of the trainees or available resources for researching the topic), a visitor may be scheduled to present a session on this subject;

- As part of the seminar that includes fish processing and preparation, the trainees who have been assigned that topic lead the group in hosting a fish fry. Here the trainees get their first opportunity to clean and prepare fish in a variety of ways.

- Personal interviews are conducted with each trainee to discuss continuing progress in the program.

Week Six - Seminar Preparation:

- Trainees spend the majority of their time researching their seminar topics. They are given access to a variety of experts through personal or telephone interviews and, for the first time, to written resource materials. Individuals or pairs of trainees meet often with staff members to discuss their progress, and a practice run of each seminar is held with staff prior to the actual presentation;

- On Friday and Saturday, the first two seminar presentations take place. The first presentation is on extension and administration. This presentation should include demonstrations of several extension techniques and should serve as a model for the remaining seminars. The Site Selection/Pond Construction Seminar is scheduled this early so that any spare during the following week can be used to begin work on the pond construction project that will be coordinated by the trainees who present this topic;

- Trainees complete their third evaluation of the program.

Week Seven - Seminar Presentations:

- The week is devoted to presentations of the seminars. Trainees receive technical information, experience in public speaking, and exposure to a variety of extension techniques. Short critiques are facilitated by the trainees at the completion of each presentation which help trainees evaluate and improve their communication skills.

Week Eight - Field Trip:

- Trainees visit farmers, extensionists and researchers in the field of aquaculture. They see practical applications of the extension and technical issues they discussed in seminars and are exposed to various facets of the U.S. aquaculture industry. This overview gives the trainees a sense of the potential of aquaculture and provides them with a valuable perspective for their roles as volunteers working in the very early stages of development of this industry in their respective countries. Since the trip provides a break in the routine and tensions of training as well as a change of scenery, it gives the trainees a chance to get rejuvenated. The trainees' technical discussions with industry leaders serve as a tremendous confidence boost. They usually return from this trip with renewed energy and heightened motivation that help them during the last two weeks of the program.

Week Nine - Country Specifics, Construction and Advanced Pond Design:

- Trainers, visiting field staff, and RPCV's provide country specific information through question/answer sessions, slide shows and discussions. These sessions include technical information, programming issues, and other material regarding life as a Peace Corps volunteer;

- Trainees continue the construction of a fish pond under the direction of their group leaders. This is an extremely important project. Trainees are responsible for every phase, from surveying, design and staking through construction. In addition to reinforcing and putting together the many technical skills involved, this gives trainees an appreciation for the labor required to build a pond. Most importantly, building the pond tremendously increases the trainees' confidence in one of the most intimidating aspects of the job of a fisheries volunteer;

- A final site selection/pond design exercise is done to reinforce the techniques learned on the field trip and in seminars. In this exercise as much emphasis is placed on extension methodology as on the technical aspects;

- As final harvests begin, trainees market some of their fish in the local community and prepare some of their fish for another fish fry;

- Trainee-facilitated meetings take place at the end of the week in which some of the most important technical concepts covered throughout training are tied together. Staff members meet frequently with the trainee facilitators to provide guidance and feedback as they prepare their sessions.

Week Ten - Harvests, Final Reports and Closure:

- Trainees harvest their ponds. They write a final report in which they process and evaluate their individual pond management practices and experiences. Discussion of the final report is included as part of the final interview;

- A meeting is held in which the trainees are encouraged to give thought to the range of emotions they may experience upon arrival in their countries of assignment, and to the possible effects of, and strategies for coping with, culture shock;

- A final dinner is held to formally conclude training. Trainees receive certificates to document their successful completion of the program.

Weekly Schedule of Events: (see following pages)

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK ONE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Orientation: - Staging - Introductions - Program Introduction - Logistics Evening: Trainer Slides	Expectations, Norms and Rules Individual Focusing Pond Observations Begin Personal Interviews Evening: Trainer Slides	Pond Observations Personal Interviews	Pond Observations Pond Assignments Begin Management Plan Outlines Complete Personal Interviews	Complete Pond Observations Pond Assignments Management Plans, Sections on: - Outline - Pond Preparation and Maintenance Processing of Pond Observations	Management Plans, Sections on: - Pond Preparation and Maintenance - Stocking Trainees Introduced to Tool Requisition Procedures Pond Preparation Processing of Week One, Bridge to Peace Corps Group meeting: Plan Logistics for Weekend

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK TWO

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Managemment Plans, Sections on: - Pond Preparation and Maintenance - Stocking Pond Preparation	Management Plans, Sections on: - Pond Preparation and Maintenance - Stocking Pond Preparation Begin Stocking of Ponds	Management Plans, Sections on: - Stocking - Accounting Pond Preparation Stocking of Ponds	Management Plans, Sections on: - Stocking - Feeding - Accounting Pond Preparation Stocking of Ponds Group Discussion on Fish Handling	Management Plans, Sections on: - Stocking - Feeding - Fertilization - Accounting Pond Preparation Stocking of Ponds	Complete Stocking of Ponds Management Plans, Sections on: - Feeding - Fertilization - Sampling - Water Quality - Accounting Group Discussion about Profit Incentive in Fish Farming Group Meeting: Review Week, Logistics for Weekend Trainee Evaluation of Program

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK THREE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Quiz Management Plans, All Sections at Individual Pace: - Feeding - Fertilization - Sampling - Water Quality - Harvesting - Marketing - Accounting Trainees Take Charge of Pump and Tool Shed	Pond Management Management Plans, All Sections Trainees Take Charge of Feed Shed	Pond Management Management Plans, All Sections Meeting: Weekly Technical Report Requirements Some Trainees Work with Local Aquaculturist (activities vary, examples: harvesting or sampling fish, water quality monitoring, feeding) Personal Interviews	Field Trip to Aquaculture Facility	Pond Management Processing of Field Trip (Information Gathering) Some Trainees Work with Local Aquaculturist (see note on Wednesday) Introduction and Selection of Group Leaders for Masonry and Carpentry Project(s) Personal Interviews	Pond Management Fish Dissection Personal Interviews Group Discussion of Social Awareness, Sensitivity to Local Community

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK FOUR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Pond Interviews Introduction to Surveying Equipment and Basic Field Techniques	Quiz on Surveying Surveying Field Projects (practice with equipment and application of techniques) Begin Construction of Masonry Form	Surveying Field Projects Masonry/Carpentry Project(s) Some Trainees Work with Local Aquaculturist (activities vary, examples: harvesting or sampling fish, water quality monitoring, feeding)	Surveying Field Projects Masonry/Carpentry Project(s)	Surveying Field Projects Pour Concrete for Masonry Project	Presentations of Surveying Projects Trainee Evaluation of Training Social Event (possibilities include local cultural event, party with members of community)

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK FIVE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Guest Expert: Site Selection, Pond Design and Pond Construction Remove Masonry Form	Quiz Site Development/ Pond Design Group Projects Guest Expert: Programming Issues in Peace Corps Aquaculture Projects	Site Development/ Pond Design Group Projects Meeting: Announce and Discuss Seminars Assign Seminar Topics Personal Interviews	Site Development/ Pond Design Group Projects Staff Meet with Seminar Groups/ Individuals by Topic to Discuss Outlines Guest Expert: Marketing and Economics in Aquaculture	Presentation of Group Site Development Projects Seminar Preparation Personal Interviews	Seminar Preparation Processing of Masonry Project (and Carpentry Project, if appropriate) Personal Interviews Fish Fry

WEEKLY SCEDULE

MONDAY	TUESDAY	WEDNESDAY
Seminar Preparation	Seminar Preparation	Seminar Preparati
Trainees Conduct Research at Library	Seminar Rehearsal: Seminar Groups/ Individuals Present Seminar to Staff	Seminar Rehearsal Seminar Groups/ Individuals Presen Seminar to Staff
Trainees Meet or Speak with Experts in Their Seminar Topic Areas		

CEDULE FOR TEN-WEEK PROGRAM

WEEK SIX

NESDAY	THURSDAY	FRIDAY	SATURDAY
r Preparation r Rehearsal: r Groups/ uals Present r to Staff	Pond Interviews Seminar Preparation Seminar Rehearsal: Seminar Groups/ Individuals Present Seminar to Staff	Seminar Presentation: Extension and Administration Seminar Preparation	Seminar Presentation: Site Selection/ Pond Construction Introduction of Group Pond Construction Project Trainee Evaluation of Program

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK SEVEN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Seminar Presentation: Anatomy/Physiology/ Taxonomy	Seminar Presentation: Stocking/Sampling/ Growth Seminar Presentation: Feeds/Feeding	Seminar Presentation: Water Quality/ Fertilization	Seminar Presentation: Parasites/Diseases/ Handling/Predators Seminar Presentation: Reproduction/ Genetics	Seminar Presentation: Harvest/Transport/ Processing/ Preservation/ Preparation Seminar Presentation: Levels of Complexity/ Intesity/Alternative Management Stategies	Seminar Presentation: Pond Ecology and Maintenance Group Meeting: Field Trip

WEEK EIGHT

Full week is spent visiting various facilities representing an overview of the aquaculture industry in the southeastern United States. Facilities may include federal and state hatcheries and research stations, university research and extension stations, large and small commercial fish farms, fish processing plants, feed mills, extension service offices, fish restaurants and markets, lending institutions and net-making factories.

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK NINE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Group Meetings: - Field Trip Debriefing - Schedule for Remainder of Training Begin Site Selection Project Group Pond Construction Project	Pond Interviews Meeting: Final Reports Format and Criteria Pond Construction Site Selection Project Personal Interviews Evening: Trainer or Guest RPCV Slides - Country Specific Information	Pond Construction Site Selection Project Trainer Panel Personal Interviews Evening: Trainer or Guest RPCV Slides - Country Specific Information	Presentations of Sites from Site Selection Project Pond Construction Evening: Trainer or Guest RPCV Slides - Country Specific Information	Trainer Panel Pond Construction Evening: Separate Meetings - Male and Female Volunteer Issues	Meeting: Wrap-up of Levels of Intensity Assignment Meeting: Basic Strategy for Management of *O. niloticus* Pond Construction Seining Demonstration Begin Final Harvests Marketing Exercise Fish Fry

WEEKLY SCHEDULE FOR TEN-WEEK PROGRAM

WEEK TEN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Final Harvests Final Reports Pond Construction Processing of Marketing Exercise	Complete Final Harvests Final Reports Trainer Panel Pipe Bending Demonstration	Final Reports Complete Pond Construction Meeting: Culture Shock Begin Final Interviews	Final Reports Final Interviews Clean-up Meeting: Process Group Pond Construction Project (and Carpentry Project, if appropriate)	Final Interviews Clean-up Trainees Evaluate Training Evening: Final Dinner	Shopping Packing

CHAPTER EIGHT

EIGHT-WEEK PROGRAM: LIMITATIONS, ADJUSTMENTS, PROGRAM SUMMARY AND WEEKLY SCHEDULE OF EVENTS

Limitations of eight-week program:
Certain activities must be shortened and/or speeded up, especially pond observations, management plans, and pond management. Trainees may not get as much out of these activities and feel more rushed, nervous and stressed due to the time constraints. Trainees have less time to spend at their ponds, and also have a shorter growing period for their fish, so the value of the pond work, one of the most essential components of the program, is diminished. This cuts out some learning as well as prevents trainees from seeing their fish grow significantly, an important factor in establishing their own confidence in and enthusiasm for aquaculture. It is more difficult to provide adequate feedback to the trainees. With a tighter schedule, there are fewer interviews and less opportunity for trainees to work on problem areas. The assessment component becomes more complicated and less effective. The shorter schedule also means elimination of some training exercises. In stateside training, it has been necessary to eliminate the group pond construction project which is an extremely critical aspect of the program and of the job as a fisheries volunteer.

In an eight-week program, the learning process itself, especially problem-solving type activities, are cut short, thus skill development in these areas may be decreased. A higher degree of frustration and stress on trainees and staff significantly affects quality and quantity of work, attitudes, personal relationships, and physical health. Due to shorter training, less time with ponds and no actual pond construction, trainees do not have as high a degree of self-confidence in their skills upon completion of the program.

Adjustments for eight-week program:
This training manual provides a training design and schedules for a ten-week program which, for technical reasons, had been the length of the stateside fish culture training programs for many years. Many Peace Corps Staff as well as current and returned Volunteers feel that ten-weeks are necessary if trainees are to attain the necessary level of technical competence and self-confidence. Due to budgetary constraints, however, the last two cycles of 1989 were reduced to eight weeks. If future programs are to be continued using the eight-week schedule, it is hoped that the comments and suggestions, which are based on experience gained in 1989, that follow will be of help in modifying the ten-week program described in this manual to fit an eight-week schedule:

- **Orientation, Expectations, Rules, Norms:** In general, these are all the same as in the ten-week program;
- **Individual Focusing:** Essentially the same as ten-week program;
- **Pond Observations and Processing:** The exercise is the same as the ten-week program, except that trainees are moved through it more quickly. The level of

detail expected remains the same, but trainees may not achieve that level of detail in quite as many areas. Going through this exercise more quickly actually turned out to have a positive impact on the general attitude of the trainees, and some modifications had already been made to shorten it while the program was ten weeks long. In this case, having to make this adjustment resulted in an improvement rather than a loss. There was no appreciable negative impact on the value of the exercise, and trainees seemed to view in a somewhat more positive light. This may be due in part to the fact that the processing of the Pond Observation exercise was handled differently as well. Rather than wait until the entire group completed their observations (which, in earlier ten-week programs could be as late as the middle of the following week), the Master Trainer did the processing with small groups, (as many as three or four separate sessions per day), as trainees completed the exercise. Having the opportunity to process the exercise while it was still very fresh may well have contributed to the effectiveness of the processing and to the trainees' ability to see the value of the exercise itself;

- **Management Plans:** Although the basic process and the concepts covered remained the same, this is one area where a major sacrifice is made in an eight-week program. It is true that in either program, the earlier the ponds are stocked the better, and that is why shortening the Pond Observation exercise and getting the ponds stocked sooner is recommended even if the program returns to the ten-week schedule. However, the pressure to get the ponds stocked and to get through the management plans more quickly in order to move on to surveying the following weeks seriously detracts from the excellent skill development opportunities that have always been one of the most important aspects of the management plans. The process of developing the plans as well as the technical concepts covered make the development of management plans one of the most valuable components of the program. For many trainees, this component provides a first experience with an entirely new way of learning and many new problem- solving techniques. In addition, trainees learn an enormous amount in terms of the most basic and important technical concepts in fish culture. By having to rush through the plans, trainees experience more frustration, suffer from diminished self-confidence, and have to cut short their problem-solving and analytical processes. There is little the staff can do about this other than spend as much quality time with the trainees as possible. Beyond that, it simply becomes that much more important to keep close tabs on how the trainees incorporate new information into their management plans as they acquire it and how they update and re-evaluate their plans over the course of training;

- **Pond Management:** This is another area where a major sacrifice is made in cutting the program back to eight weeks. Trainees must be able to work with their fish long enough to see the results of their management decisions, and the more time they have their fish in the ponds the more they will learn. As stated above, the earlier the ponds are stocked the better, even in a ten-week program, but in the eight-week program it is even more imperative that the ponds get stocked by early in the second week. Since surveying must be pushed up to the second week, trainees do not have an opportunity to spend most of the week immediately following stocking on pond management. They are almost immediately limited to the three daily scheduled pond times as other work takes up their time and energy. Again, there is not much that can be done, but staff should make every effort to do more pond interviews - on a weekly basis, if possible. They should be extremely stringent about respecting pond time, and should spend a lot of time with the trainees at their ponds during every pond time to ensure that trainees get as much benefit as possible out of their pond work;

- **Weekly and Final Reports:** These remain essentially the same except that staff is encouraged to put more emphasis on content rather than presentation (in earlier programs, staff members tended to be a little more stringent about presentation than we were in the eight-week cycles). Although high standards of professionalism continue to be upheld, trainers try to provide clear enough guidelines and feedback to the trainees to keep the necessity of rewriting reports to a bare minimum, and staff comments tend to emphasize the technical aspects of the reports. Trainees see the value of writing the reports more clearly, and benefit more from the trainers' comments when greater attention is paid to the aspects of the report that reflect their comprehension and application of the material;

- **Field Trips:** The major field trips remain the same, but with the eight-week schedule there is less flexibility for individual trainees or small groups to spend time working with local farmers, researchers, etc.;

- **Masonry and Wheelbarrow Projects:** In the eight-week program it is more difficult to do the masonry and wheelbarrow projects during the first half of the program. If they can be squeezed in, it will allow more time during Week Seven to address pond construction, but it is likely that these projects will not be able to take place until Week Seven;

- **Surveying:** This component remains the same except that it is scheduled much earlier in the program. This does not affect the surveying component, but starting it earlier affects the amount of time and attention trainees can give to their management plans and pond work. In addition, since surveying is taught in a somewhat more conventional manner than are the other activities that take place early in the program, the benefits of the individual experiential learning style that helps trainees develop their problem-solving abilities, independence and self-reliance are reduced;

- **Site Development and Pond Design:** This component remains the same (except for the actual Pond Construction project, which will be addressed separately), except that it takes place earlier;

- **Seminars:** Seminars remain the same, except for the points made about the fish fry (see next point);

- **Fish Fry:** In the eight-week program, the trainees will probably only be able to do one real fish fry (this being in Week Seven). Instead of the first fish fry, the trainees assigned to the Harvest/Transport/Processing/Preservation/Preparation seminar can do an abbreviated version that addresses the processing, preservation and preparation of fish, but more in the form of demonstrations than as a social event that is a group effort. In this case, the trainees doing the seminar demonstrate the different methods of processing, demonstrate the construction and use of a smoker and salting box, and perhaps prepare fish using one method. The rest of the group can practice the processing and a wider variety of preparation methods at the Week Seven fish fry;

- **Week-Long Field Trip:** Remains the same. When the decision was made to cut back the program, eliminating or shortening the Field Trip was considered. However, especially with the stateside program, most field staff and training staff felt that the benefits of the Field Trip would be, in most cases, impossible to duplicate during in-country orientation (as opposed to Pond Construction, which could be done during the technical orientation phase of in-country training). Feedback from trainees who had completed the program further reinforced the idea that having the opportunity to get an overview of the aquaculture industry instilled in them a sense of the potential of fish culture and had a tremendous impact on their enthusiasm and commitment. Seeing the concepts and techniques they were learning about being applied in "real life" helped reinforce their understanding of those concepts and techniques, and greatly increased their self-confidence;

- **Week Seven Sessions:** Essentially, the sessions that are conducted during Week Nine of the ten-week program remain the same and are conducted during Week Seven. This includes the Field Trip Debriefing, the Site Selection exercise, the presentation of final report criteria, the sessions related to providing country specific information, sessions addressing volunteer issues, special technical sessions, fish marketing and a fish fry. The major differences are that the masonry and/or carpentry projects may take place during Week Seven of the eight-week program, and that the Pond Construction project may need to be eliminated or modified;

- **Pond Construction:** This is a critical area in which reducing the length of the program has a severe effect on the trainees. No amount of classroom work, models or observation can convince someone that they know how to design, stake out and build a pond. This is probably the most intimidating aspect of the job of a fisheries volunteer, and no amount of practice with site selection, pond design or construction is ever sufficient in terms of really instilling a sense of confidence in the trainees. The actual construction of a pond is an absolutely essential element of technical training for aquaculture Volunteers, so it was with tremendous reluctance that the pond construction project was eliminated when making adjustments for an eight-week program. Field staff were informed that it was critical that a pond construction project be included in the technical orientation phase of in-country training following the stateside program.

In the first eight-week cycle conducted in this program, the trainees who presented the Site Selection/Pond Construction seminar staked out a pond as if it were to be constructed, then led the trainees through the step-by-step construction process using a large dirt and clay model that was placed out at the actual pond site. Although this was a very good effort, the final evaluations submitted by the trainees overwhelmingly cited Pond Construction as the area in which they felt the least confident, and many expressed frustration that they had not been able to construct a pond in training.

In the second eight-week cycle, trainees were so adamant about wanting to get experience in pond construction that another approach was taken. In this program, the trainees who presented the Site Selection/Pond Construction seminar coordinated a group project in which trainees built new dikes in existing ponds (transforming two ponds into three ponds, in this case). This did provide an opportunity to get actual experience moving dirt, tamping dikes, putting in an anti-seep collar, etc. It did not, however, allow trainees to experience each step involved in constructing a pond from beginning to end. Trainees still felt uncomfortable with their level of competence in pond construction at the end of training.

Both of the approaches described here had some value. Another possibility would be to have trainees construct a much smaller pond than usual, but to do all of the steps. This might work well, but staff should be very careful when such a project is considered. The project must provide realistic, valuable experience and not simply be a gesture that lacks actual application. If a very small model is constructed, the experience may actually be misleading since working with topography and soil, principles of cut and fill, effects of surveying or staking errors, fluid dynamics, and labor are all aspects of pond construction that are much different on a real-life scale than they are on a very small scale;

- **Assessment:** This was another area where the shorter program posed some difficulties. There is less time to work with the trainees, so the staff cannot get to know them as well. With less time for collection of behavioral data, important trends or patterns may not be discerned. It becomes more difficult for both trainees and staff to determine the areas in which the trainees need further development, and there is less opportunity to implement strategies that are designed to help them improve in targeted areas. This is especially frustrating for trainees who enter training with non-biology backgrounds and require more time and work with the staff to develop their technical skills and confidence. In the case of problem trainees, it is more difficult to adhere to all of the steps of the required administrative procedures if an administrative separation becomes a possibility, and the trainee has less opportunity to make specified changes, improvements or progress. In addition, with the schedule even tighter than in the already crowded ten-week program, it is more difficult to make time for interviews. Staff and trainees are under so much pressure that interviews may be rushed, or trainees may be too distracted with all of their other work to put as much thought and attention into self-assessment and responding to feedback. The recommended interview schedule for the eight-week program is similar to that of the ten-week program, with interviews held Week One, Week Three, and Week Seven, plus the final interview. In addition, staff should meet with trainees very briefly after they complete their seminar presentations during Week Five to discuss the trainees' feelings about their seminar presentations, provide staff feedback on the seminars, and check-in with the trainees regarding their general attitude and any concerns they may want to express;

- **Additional Comments:**
    - To summarize the above points, the reduction in the length of training has the biggest impact on actual training activities in the areas of Pond Observations, Management Plans, Pond Management and Pond Construction. In the case of the Pond Observations, this turned out to be a positive aspect of the change, and the changes made to the program in the first week would actually work better in the ten-week program as well, allowing the ponds to get stocked sooner and the trainees to see more value in the Pond Observation exercise. In the cases of Management Plans, Pond Management, and the Pond Construction project, the effects are negative. Most other activities remain the same, except that everything is more crowded and there may be less preparation time for some projects and assignments;

    - Some of the most important effects of reducing the length of the program are more subtle. The ten-week program was already hectic, crowded and stressful. In the eight-week program, trainees are under tremendous pressure and time constraints. This not only affects the quality of the trainees' work and thought processes, but also reduces the potential for their skill development as a direct result of time constraints. It also wears them down physically and emotionally, thus further aggravating the problems. Trainees often suffer from a lack of sleep and have difficulty concentrating. Their efforts must divided among so many tasks that they become extremely frustrated that they cannot do any of them as well as they know they should and could. The results are then not what they would like, which diminishes their self-esteem and confidence;

    - In light of what was mentioned in the last comment, it is imperative that staff be especially sensitive to the physical and emotional state of the trainees. Try to observe all individuals carefully and follow up on any extreme or sudden changes in behavior. Do not wait for scheduled interviews to check in with trainees who appear to be depressed or unusually distracted. Trainers should make a special point of noting trainees who seem to be up very late every night, or trainees who miss a lot of meals. Keep lines of communication open. It is important to try to have an occasional social event or light day, even though this will be extremely difficult. There may even be times when it is necessary to sacrifice some important training activity in order to address other needs of the trainees. None of this is meant to be over-stated, and trainees should not be coddled in the eight-week program any more than they should be in the ten-week program, but the issues raised in the last comment are very real ones and should not be taken lightly;

    - Just as trainees are under tremendous pressure and work loads, so are the staff members. Staff members should watch out for one another and put a lot of effort into keeping themselves physically, mentally and emotionally stable so that they can provide the necessary support to the trainees;

- Reducing the program to eight weeks is not a good decision in the opinion of this staff. However, if that is to be the case, every effort should be made to make whatever adjustments are necessary to have the best program possible. This begins with the attitude of the training staff. Regardless of their personal feelings, they must accept the situation and avoid projecting a negative attitude. Trainers should never imply to the trainees that they are at a disadvantage or that they will not be able to have a quality training because of the shortened program. This would not only be unprofessional -it would be unfair and harmful to the trainees. With a positive, upbeat atmosphere and dynamic, enthusiastic leadership, trainees can accomplish a tremendous amount under even the most difficult circumstances. With good planning, tight organization, creativity, and a competent staff that works well as a team, the eight- week program can be effective. If the program is stateside or regional, it is essential that the key gaps described above be addressed during an in-country orientation.

Weekly Program Summary:

Week One - Orientation, Pond System Observations and Introduction to Pond Management:

- The trainees and staff get acquainted and trainees become familiar with the local area, living quarters and basic logistics of training. Information is provided on the training program, logistics, rules and Peace Corps policies. Administrative forms are completed. Trainees' expectations of training are discussed. The training program objectives, design and methodology are related to volunteer effectiveness;

- Short interviews take place to allow staff to meet each trainee on an individual basis and to give the trainees opportunities to express concerns, hopes or interests, and ask specific questions;

- Trainees sharpen their observation skills, become familiar with the training site, and begin to adjust to an individual style of learning through a detailed and thorough study of the pond system and surrounding area. They begin to learn and develop specific questions about aquaculture based on their observations;

- Each trainee is assigned a pond to manage throughout the training period. Trainees spend the week defining goals, writing work plans, and working in their ponds. Through the development of detailed, comprehensive Management Plans, basic technical and biological concepts of pond culture are explored, and trainees are encouraged to formulate additional questions related to their work. They begin to think of themselves as fish farmers, to view aquaculture as a form of agriculture, and to recognize the importance of economics and profitability. Brainstorming and goal setting are introduced as problem solving techniques;

- Through pond preparation and stocking, trainees begin doing the physical tasks involved in aquaculture, working with various tools and equipment, using the pumps and associated plumbing, and handling fish. In order to obtain equipment, trainees are required to follow a requisition system that is explained to them by a staff member.

Week Two - Advanced Pond Management and Introduction to Surveying:

- Trainees finish stocking their ponds and develop the main sections of their management plans. By mid-week, they are carrying out a variety of daily activities at their ponds, learning about fish and fish culture through experience. This will continue throughout the program as they continue to manage their ponds. Through stocking their ponds, some trainees have had their first experience physically working with fish, and a meeting is held in which they can share their experiences and develop some guidelines regarding the proper handling of fish. Responsibility for the maintenance of tools and feed sheds are turned over to the training group;

- A special meeting is held once all of the ponds are stocked to help trainees process what they have experienced thus far in training and to help them see training more clearly in the context of their role as Peace Corps Volunteers. They are encouraged to think about their training from the perspective of Peace Corps and the host country, and to consider the needs they will be expected to meet as volunteers. The trainees are encouraged to define their goals for the eight-week program. They are informed of the staff's expectations of them during the program as well;

- Trainees are instructed in the use and care of surveying equipment. They are required to complete a series of exercises which reinforce the techniques and introduce the basics of pond design. One of the surveying projects is conducted in small groups, then presented to the large group in a formal setting. In addition to obtaining specific new technical skills and applying them in a variety of ways, the exercises permit trainees to sharpen their leadership skills and to practice working effectively in groups. The presentations give them an opportunity to develop their public speaking styles, share and reinforce the technical material they have learned, and serve as an introduction to extension techniques. Critiques following each presentation provide opportunities for giving and receiving feedback, while becoming familiar with the rules and guidelines for proper feedback;

- At the end of the week, trainees are asked to evaluate the training program to date by means of a prepared form.

Week Three - Advanced Site Selection and Pond Design:

- Trainees spend a day with an expert in site selection, pond design and pond construction from the Soil Conservation Service. They receive both classroom and field instruction, then participate in several exercises. For the rest of the week they work in small groups on a site development exercise, laying out a viable pond and presenting it to the group. Extension techniques are emphasized as a part of these presentations;

- Through management of their ponds, trainees have developed enough specific, clear questions about fish and aquaculture to take advantage of opportunities presented by access to resource people and visits to other facilities. Field trips are scheduled and trainees get hands-on experience working with fish culturists at nearby facilities. Trainees are expected to apply the information they gain to their own ponds. Information gathering, professionalism and social awareness are stressed in their interactions with resource people and the community as a whole;

- Trainees are made aware of the requirements for weekly technical pond reports in which they are to document all activities that occur with their individual ponds, report data they collect, their interpretation of that data, and plans for the following week. Professional record keeping and report writing becomes an increasingly important theme as training progresses;

- Trainees are informed of their responsibilities for seminar presentations. For these presentations, the various aspects of fish culture and extension are organized into a series of seminar topics. Each trainee is assigned a topic to research and present to the group. If Marketing and Economics is not to be included among the seminar topics (this may depend on the size of the group, backgrounds of the trainees or available resources for researching the topic), a visitor may be scheduled one evening to present a session on this subject;

- Personal interviews are conducted with each trainee. In preparation for these interviews, trainees are asked to fill out a self-evaluation form. During the interview, the staff and the trainee compare notes on how each thinks the trainee is progressing in various aspects of training. If the staff or trainee feels it is appropriate, ideas are exchanged and suggestions are made on how improvements can be brought about in certain areas.

Week Four - Seminar Preparation and Wheelbarrow Construction:

- Trainees spend the majority of their time researching their seminar topics. They are given access to a variety of experts through personal or telephone interviews and, for the first time, to written resource materials. Individuals or pairs of trainees meet often with staff members to discuss their progress, and a practice run of each seminar is held with staff prior to the actual presentation;

- Three or four trainees serve as group leaders for a wheelbarrow construction project. Each leader works with a separate group of trainees, and each group designs and builds its own wheelbarrow. (Note: Wheelbarrow project is optional. See Chapter Thirteen, "Masonry and Carpentry Projects");

- On Friday and Saturday, the first two seminar presentations take place. The first presentation is on extension and administration. This presentation should include demonstrations of several extension techniques and should serve as a model for the remaining seminars. The Site Selection/Pond Construction Seminar is scheduled this week as well;

- Trainees complete another evaluation of the training program;

- If possible, participation in a local festival or social event is scheduled.

Week Five - Seminar Presentations:

- The week is devoted to presentations of the seminars. Trainees receive technical information, experience in public speaking, and exposure to a variety of extension techniques. Short critiques are facilitated by the trainees at the completion of each presentation which help trainees evaluate and improve their communication skills. As part of the seminar that includes fish processing and preparation, the trainees get their first opportunity to clean and prepare fish in a variety of ways.

Week Six - Field Trip:

- Trainees visit farmers, extensionists and researchers in the field of aquaculture. They see practical applications of the extension and technical issues they discussed in seminars and are exposed to various facets of the U.S. aquaculture industry. This overview gives the trainees a sense of the potential of aquaculture and provides them with a valuable perspective for their roles as volunteers working in the very early stages of development of this industry in their respective countries. Since the trip provides a break in the routine and tensions of training as well as a change of scenery, it gives the trainees a chance to get rejuvenated. The trainees' technical discussions with industry leaders serve as a tremendous confidence boost. They usually return from this trip with renewed energy and heightened motivation that help them during the last two weeks of the program.

Week Seven - Country Specifics, Masonry and Advanced Pond Design:

- Trainers, visiting field staff, and RPCV's provide country specific information through question/answer sessions, slide shows and discussions. These sessions include technical information, programming issues, and other material regarding life as a Peace Corps volunteer;

- If wheelbarrows have not been completed, they are finished this week. A masonry project is also implemented under direction of trainee coordinators. The trainees who presented the seminar on pond construction may lead a project to provide some practice in this skill area in lieu of the actual group pond construction project that takes place in the ten-week program. A trainer or trainee demonstrates the bending of PVC pipe;

- A final site selection/pond design exercise is done to reinforce the techniques learned on the field trip and in seminars. In this exercise as much emphasis is placed on extension methodology as on the technical aspects;

- As final harvests begin, trainees market some of their fish in the local community and prepare some of their fish for a fish fry, to which trainees are encouraged to invite guests;

- Trainee-facilitated meetings take place at the end of the week in which some of the most important technical concepts covered throughout training are tied together. Staff members meet frequently with trainee facilitators to provide guidance and feedback as they prepare their sessions;

- Personal interviews are held during the early part of the week.

Week Eight - Harvests and Final Reports:

- Trainees harvest their ponds. They write a final report in which they process and evaluate their individual pond management practices and experiences. Discussion of the final report is included as part of the final interview;

- A meeting is held in which the trainees are encouraged to give thought to the range of emotions they may experience upon arrival in their countries of assignment, and to the possible effects of, and strategies for coping with, culture shock;

- A final dinner is held to formally conclude training. Trainees receive certificates to document their successful completion of the program.

Weekly Schedule of Events: (see following pages)

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK ONE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Orientation: - Staging - Introductions - Course intro - Logistics Expectations, Norms and Rules Individual Focusing Pond Observations Begin Personal Interviews Evening: Trainer Slides	Pond Observations Pond Assignments Begin Management Plan Outlines Personal Interviews	Complete Pond Observations Processing of Pond Observations Pond Assignments Management Plans, sections on: - Outline - Pond Preparation and Maintenance - Stocking Trainees Introduced to Tool Requisition Procedures Pond Preparation Personal interviews	Management Plans, sections on: - Pond Preparation and Maintenance - Stocking Pond Preparation Complete Personal Interviews	Begin Stocking Ponds Management Plans, sections on: - Stocking - Accounting Pond Preparation	Group Discussion About Profit Incentive in Fish Farming Management Plans, sections on: - Stocking - Feeding - Fertilization - Accounting Pond Preparation Stocking of Ponds Group Meeting: Review Week's Activities, Plan Logistics for Weekend

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK TWO

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Group Discussion on Fish Handling Management Plans, sections on: - Feeding - Fertilization - Sampling - Water Quality - Accounting Pond Preparation Stocking of Ponds	Complete Stocking Pond Management Management Plans, all sections at individual pace Trainees Take Charge of Pump and Tool Shed Group Meeting: Processing of Week One, Bridge to Peace Corps	Quiz Introduction to Surveying Equipment and Basic Field Techniques Pond Management Management Plans, all sections	Quiz on Surveying Some Trainees Work with Local Aquaculturist (activities vary, examples: harvesting or sampling fish, water quality monitoring, feeding) Surveying Field Projects (practice with equipment and application of techniques) Pond Management Management Plans, all sections	Presentation by Trainees who Worked with Aquaculturist Surveying Field Projects Pond Management	Presentations of Surveying Field Projects Fish Dissection Group Meeting: Social Awareness, Sensitivity to Local Community Trainee Evaluation of Program Evening: Social Event (possibilities include local cultural event, party with members of community)

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK THREE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Guest Expert: Site Selection, Pond Design and Pond Construction	Quiz Site Development/ Pond Design Group Projects Some Trainees Work with Local Aquaculturist (activities vary, examples: harvesting or sampling fish, water quality monitoring, feeding) Personal Interviews	Pond Interviews Site Development/ Pond Design Group Projects Personal Interviews	Presentation of Group Site Development Projects Personal Interviews	Field Trip to Aquaculture Facility Pond Management	Group Meeting: Processing of Field Trip (Information Gathering) Personal Interviews Group Meeting: Weekly Technical Report Requirements Group Meeting: Announce and Discuss Seminars Assign Seminar Topics

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK FOUR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Staff Meet with Seminar Pairs/ Individuals by Topic to Discuss Outlines Selection and Notification of Group Leaders for Wheelbarrows (if appropriate) Seminar Preparation Personal Interviews	Seminar Preparation Trainees Conduct Research at Library Trainees Meet or Speak with Experts in Their Seminar Topic Areas Wheelbarrow Project	Some Trainees Work with Local Aquaculturist (activities vary, examples: harvesting or sampling fish, water quality monitoring, feeding) Seminar Preparation Individual Seminar Groups Meet with Staff Wheelbarrow Project	Pond Interviews Seminar Preparation Individual Seminar Groups Meet with Staff Wheelbarrow Project	Seminar Presentation: Extension and Administration Seminar Preparation Individual Seminar Groups Meet with Staff	Seminar Presentation: Site Selection/ Pond Construction Introduction of Group Dike or Pond Construction Project (if appropriate) Trainee Evaluation of Program

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK FIVE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Seminar Presentation: Presentation: Taxonomy/Anatomy/ Physiology	Seminar Presentation: Stocking/Sampling/ Growth Seminar Presentation: Feeds/Feeding	Seminar Presentation: Water Quality/ Fertilization	Seminar Presentation: Parasites/Diseases/ Handling/Predators Seminar Presentation: Reproduction/ Genetics	Seminar Presentation: Harvest/Transport/ Processing/ Preservation/ Preparation Guest Expert: Marketing and Economics	Seminar Presentation: Levels of Complexity/ Intensity/Alternative Management Strategies Seminar Presentation: Pond Management Group Meeting: Field Trip

WEEK SIX

Full week is spent visiting various facilities representing an overview of the aquaculture industry in the southeastern United States. Facilities may include federal and state hatcheries and research stations, university research and extension stations, large and small commercial fish farms, fish processing plants, feed mills, extension service offices, fish restaurants and markets, lending institutions and net-making factories.

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK SEVEN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Group Meetings: - Field Trip Debriefing - Schedule for Remainder of Training Begin Site Selection Project Trainees Organize for Group Projects: Masonry, Carpentry, Dike or Pond Construction (if appropriate) Evening: Trainer or Guest RPCV Slides - Country Specific Information	Group Meeting: Final Reports Format and Criteria Masonry, Carpentry and Dike or Pond Construction Site Selection Project Personal Interviews Evening: Trainer or Guest RPCV Slides - Country Specific Information	Pond Interviews Site Selection Project Masonry, Carpentry and Dike or Pond Construction Trainer Panel Personal Interviews Evening: Trainer or Guest RPCV Slides - Country Specific Information	Presentations of Sites from Site Selection Project Masonry, Carpentry and Dike or Pond Construction Personal Interviews Evening: Trainer or Guest RPCV Slides - Country Specific Information	Trainer Panel Masonry, Carpentry and Dike or Pond Construction Pipe Bending Demonstration Evening: Separate Meetings on Male and Female Volunteer Issues	Group Meeting: Wrap of Levels of Intensity Assignment Group Meeting: Basic Strategy for Management of *O. niloticus* Masonry, Carpentry and Dike or Pond Construction Begin Final Harvests Marketing Exercise Fish Fry

WEEKLY SCHEDULE FOR EIGHT-WEEK PROGRAM

WEEK EIGHT

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Final Harvests Final Reports Masonry, Carpentry and Dike or Pond Construction Trainer Panel	Complete Final Harvests Final Reports Masonry, Carpentry and Dike or Pond Construction	Final Reports Complete Masonry, Carpentry and Dike or Pond Construction Group Meeting: Culture Shock Shock Begin Final Interviews	Final Reports Final Interviews Clean-up Group Meeting: Process Masonry, Carpentry, Dike or Pond Construction and Marketing Projects	Final Interviews Clean-up Trainees Evaluate Training Evening: Final Dinner	Shopping Packing

CHAPTER NINE

PROGRAM DESIGN CONSIDERATIONS AND ORIENTATION

While reviewing and using the information contained in the following chapters, training program staff should consider the following:

- Time frames given for specific sessions or activities are approximations of formal time, but do not include additional time that trainees will spend on their own preparing presentations, doing extra field work, or working on homework assignments and reports;

- Remember that training is not simply a flow of discrete activities that occur one at a time. Trainees have ongoing projects and there is a tremendous amount of overlap. Trainees manage their ponds throughout the program, in addition to all of the other activities. There are many demands on trainees' time, and good time management is a constant challenge to trainees and staff alike;

- Encourage trainees to note the links between different activities and to integrate what they learn at each step into their work as appropriate. This is especially applicable to their pond work, i.e., they can learn a lot through observing and working with their ponds and fish that will pique their interest for information that comes later, will allow them to develop clear questions, and will permit them to speculate so that some of what they learn will serve to reinforce what they already worked out on their own. On the other hand, as they acquire new information they will have the opportunity to apply that information to their pond management and use their ponds to reinforce the new learnings;

- Both staff and trainees should be constantly watching for opportunities to integrate activities and note the relationships among all of the factors involved in aquaculture and extension work;

- Once ponds have been stocked, the schedule should be set up so that there are standard pond time hours each day. It is recommended that trainees have three blocks of pond time per day, once in the early morning (before breakfast or upon arrival at the training site), once during the lunch hour (lunch can be extended to 90 minutes so that trainees can use the block as they see fit for their own lunch and their pond time), and once in the late afternoon (the last 45 minutes to an hour before the end of formal training each day). Other activities may occasionally necessitate missing certain blocks of pond time, but every effort should be made to keep this time sacred. During pond time, trainers should circulate and interact with trainees occasionally at their ponds. To avoid having several staff members interacting with a particular trainee during a single pond time, which could become intrusive and distracting rather than helpful, staff should have a rotation system. The system should be such that each trainer is assigned a particular set of trainees to observe and interact with during each day's pond times. Trainers rotate each day so that all staff members will be familiar with the activities of all trainees. Trainers should remember that the trainees are the managers of their own ponds and should be permitted to make their own decisions. Staff members' interactions should be based on careful judgement so that they are not overbearing. In general, trainers should serve mainly as sounding boards to allow trainees to talk out problems they are having or issues they are finding puzzling regarding their pond work. Trainers may ask some questions to stimulate the trainees' own though processes, but should not pressure trainees into making "correct" management decisions;

- Evenings and Sundays, although not usually used for scheduling structured activities, are still often used for training activities. During these times trainees often work on their ponds; feed and/or sample their fish; work on reports, presentations or other assignments; set up meetings with trainers to get extra help on problems they are tackling or to advance their progress and do field work as needed on special projects;

- Evenings are sometimes used for formal training activities such as special meetings, slide shows by staff members or guests or seminars (if behind schedule). They may also be used for social events such as a party or a fish fry;

- The manual contains sample designs for many of the activities and sessions. However, this manual is not comprehensive. Many short meetings are held to deal with special issues or circumstances that arise, to check on trainee progress or mood of the group, or to make announcements. Either staff or trainees may request meetings, and either staff or trainees may facilitate meetings. (For example, trainees who are group coordinators for special projects often call meetings to organize those projects.) In cases of meetings that are set up and/or facilitated by trainees, staff should be informed, present and as involved as is appropriate, depending upon the nature of the meeting;

- Remember that trainees are told to take responsibility for their training, and encourage them to think of the program as their program. As training continues, trainees take increasing possession of the program. This does not mean that the staff is excluded, but trainee requests and expressed needs should be considered carefully and addressed (even if it is not possible to fulfill particular requests, this should be acknowledged), and they should be encouraged to take charge of their own activities as much as possible and reasonable.

CHAPTER TEN

PROGRAM DESIGN - WEEK ONE

Session I-1: Trainee Arrival

Objectives:

- Welcome all trainees upon their arrival and ensure that all trainees and their luggage are accounted for;
- Provide opportunity to meet training staff;
- Provide transportation from the airport to the training site;
- Notify trainees about logistical arrangements and the schedule of events prior to the formal Orientation session;
- Help trainees to get settled into their accommodations.

Overview: The specific arrangements that are made for handling trainee arrival must be determined for each situation. In any case, however, it is important that trainees be met as soon as possible upon their arrival, whether coming to training individually or as one large group. The following is not a session design, but is a set of guidelines and suggestions for staff. The procedures used here can be modified to fit other situations.

1. At least one day prior to the trainee arrival date, staff should be sure they are fully prepared, and should do a step-by-step run-through of the events to take place the following day. This is tremendously helpful in finding potential problems and identifying details that have not been fully addressed. A helpful tool is a checklist which should include the following:

- Each trainer has a copy of the flight numbers and arrival times of all trainees, as well as a rooming list showing the room numbers of all trainees, and a list of points for the trainers to remember;
- Each trainer should be thoroughly familiar with the route to the airport and the location of airport parking lots;
- The trainer in charge of vehicles should have checked over all vehicles, have them full of gas and ready to go. If appropriate, have tarp and rope on hand for securing and protecting luggage in the pick-up truck. He/she should also have worked out a very detailed schedule for exactly which vehicles will be used for which trips, as well as which trainer will be driving each one for each trip. (This can get quite complicated if the trainees are arriving separately and their arrival times are spread out enough to necessitate several airport runs. The distance between the airport and the training site can also affect vehicle availability for each trip. The person coordinating this should be sure to figure in generous loading and travel time in determining vehicle availability);
- The trainer who is the contact person for the lodging staff should have the names of the trainees staying in each room posted on the doors, and should have all room keys in his/her possession to distribute to trainees;
- The trainer who is the contact person for the lodging staff should have gone through each room, making thorough notes of the condition of each room, all furniture, etc.,

and noting any damaged furniture, stains, etc. prior to the arrival of the trainees. These notes should be photocopied, and one copy should be given to the lodging staff before trainees arrive, while the other copy is maintained in the training staff office;

- All necessary arrangements should be made regarding meals during the day of trainee arrival. (Once training begins, there will be a set schedule, but the day of arrival often requires special arrangements). Be sure it is clear which meals will or will not be provided by the training program and which, if any, are to be at the trainees' own expense using their travel advance money;
- Trainers should have prepared a sign to hold up as trainees arrive;
- Trainers should have their name tags;
- Trainers should have handouts to give the trainees upon their arrival (an example showing the kind of information to be included on the handout is attached);
- If trainees are to receive registration and/or walk-around checks upon arrival, a trainer should have those checks as well as sign-up sheets to document trainees' receipt of the money. In addition, all necessary arrangements should have been worked out with the local bank or whatever means will be used for cashing checks.

2. On the day trainees arrive, trainers have a sheet of instructions or reminders, and carry out the procedures that have been decided upon. The following points are included on their reminder sheets and provide a general outline of the flow of events:

- Leave for the airport in plenty of time to meet first arrival;
- At the airport, find out where would be best place to have trainees pile their luggage while waiting for others to arrive;
- Wear name tags;
- Have Peace Corps Aquaculture Program sign;
- Meet all trainees as they come off the plane, welcome them and introduce yourselves;
- Get trainee's name, check off that s/he has arrived, look up room assignment;
- Tell trainee that since there will not be a formal meeting tonight, you are giving him/her a handout with important information. He/she should be sure to read it now;
- As trainee waits, you fill in name, room number, loading time and departing time. Note: There are different handouts, one for the first two runs and another for the late run. Be sure you give out the right one!;
- Show trainee where to put luggage until it's time to load the truck;
- If someone's luggage did not arrive, have the trainee wait until a trainer is available to accompany him/her to the desk to give directions for delivery;
- If a trainee does not arrive, check at the airline desk to see if he/she had checked in. Also, call and notify the Master Trainer about the situation;
- For the first run, trainees will have several hours between arrival at the motel and departure for supper. Suggest that they use the time to settle in, unpack and get acquainted. Suggest that since they are not yet familiar with the area, it would be best if they stay in the general vicinity of the motel for this afternoon. If they choose to take a walk, suggest they go with at least one other trainee;

- For the late run, note the time you arrive, since the van is to leave for supper about fifteen minutes later. Announce the exact time the van will leave for supper once you pull into the motel. Be sure to leave for supper on time.

3. Upon arrival at the lodging area, a trainer meets the arriving trainees,distributes room keys and provides any necessary assistance for settling in.

Materials:

- All necessary vehicles, full of gas, clean and in excellent condition;
- Rope, tarps;
- Welcome signs;
- Trainer name tags;
- Handouts for trainees (see sample below);
- Trainee checks, if appropriate;
- Sign-up sheet for trainee checks;
- Lists for each trainer with arrival times, flight numbers and room assignments for all trainees;
- Checklists or reminder sheets for trainers, including clear schedule of vehicle use that tells which vehicle is to be used for each trip, the time of departure and arrival, and the trainer who will be driving;
- All room keys for trainees' rooms.

Sample Handout:

PEACE CORPS AQUACULTURE TRAINING PROGRAM

Trainee Name:

Welcome to the Peace Corps Aquaculture Training Program.

Luggage: Please bring your baggage to the front of the terminal at (time) for loading.
Departure time: Your vehicle will leave the airport at (time).

Living accommodations: You will be living at ________________________. Your room number is ____. Smoking is not permitted in the rooms.

Travel and Walk-around Allowance: You will receive two checks - one for $20.00, which will cover meals and incidental expenses incurred during travel to the training site, and one for $28.00 which will cover incidental expenses for the first week of training. If you wish to have your checks cashed, please sign them and return them to the trainer with a piece of photo identification. The checks will then be cashed and the money will be given to you.

Meals: This evening, vehicles will leave for dinner from the motel at 7:15 pm.
(For people arriving on the later run, this section read: Vehicles will leave for dinner 30 minutes after arriving at the dorms. For this evening, you will be dropped at a Pizza Hut, and dinner will be at your own expense, to be covered by your travel allowance. Starting tomorrow, the training program will provide your meals.)

In the morning, vans will depart for breakfast promptly at 6:30 A.M. We will not be returning to the motel after breakfast so please come ready for the day.

Tomorrow Morning: Tomorrow, please bring the following with you to Orientation:

- All the forms you received in your invitational packet from Peace Corps;
- Your WHO card if you have one;
- Some form of identification that has a photo;
- One visa photo with your name printed on the back.

There will be more forms to complete, so be sure to bring any addresses and phone numbers you may need. This includes information for insurance beneficiary forms, emergency contact people, student loan forms etc.

Session I-2: Orientation

Total Time: 4 hours, 35 minutes

Objectives:

- Complete and collect all required Peace Corps forms, discuss Peace Corps policies and address any other administrative business;
- Provide overview of training program;
- Introduce staff and trainees;
- Provide the trainees with important logistical information;
- Provide opportunity for trainees to discuss their expectations of training and address those expectations;
- Present rules of the program and suggest that trainees develop a set of norms;
- Explain the assessment component of the program;
- Make announcements to prepare trainee for upcoming events.

Overview: The Orientation Session is the first formal meeting and serves as a welcome and introduction to the program. It is unlike most of the other activities that will occur in the program in that it has more of a lecture format (with staff members doing most of the lecturing), and it is considered more "pre-training" than actual training. It does, however, set a tone for the program and demands attention to detail and careful planning on the part of the staff in order to ensure a smooth, professional and comfortable atmosphere. The Orientation Session should serve to answer most of the trainees' more immediate questions about the general flow and logistics of the program and to fully address any necessary administrative business so that trainees leave the session prepared to begin training the following day.

30 minutes

1. Designated staff member(s) arrive at orientation area and make all necessary preparations. Set up includes:
    - Arrange chairs, blackboard, flip chart stands (be sure posters, prepared newsprint, etc. are within easy reach of the speaker and stacked in the order in which they will be used);
    - Be sure chalk, erasers, extra newsprint, markers and tape are conveniently placed for the speaker;
    - Prepare table with extra copies of all mandatory and optional forms, sign-up sheets, etc.;
    - Prepare a table or box for the collection of completed forms;
    - Set up a table and chair near the entrance with trainees' name tags, markers and a box with check-off list for collecting photos as trainees arrive;
    - Set up refreshments area (this may involve putting water in coffee urns, filling ice chests, or whatever is appropriate as well as putting out cups, spoons, etc.);
    - Be sure rest room facilities are clean and properly stocked.

10 minutes

2. Trainees arrive. A trainer greets them as they come in, collects a visa photo from each trainee with the trainee's name on the back, and gives each trainee his/her name tag.

Suggest that trainees who prefer to be called by a nickname write it on the name tag with a marker. Keep a list of any trainees who have not brought visa photos, and instruct them when and where to meet a trainer to have a photo taken. Trainees are seated.

15 minutes
3. The Project Director welcomes the trainees and presents an overview of the organizational structure of the training program, the training facilities and any other appropriate introductory information. The schedule for the orientation meeting is presented, and the training staff and any visiting Peace Corps or local officials are briefly introduced.

35 minutes
4. The Project Director (or visiting official from Peace Corps) gives a brief introduction to Peace Corps and goes through all of the mandatory and optional forms. He/she should have a copy of each form on hand to show trainees, as well as extra copies available for them to use. The trainees are given time to complete all of the forms as the Project Director goes over them, answering their questions as necessary. With the help of one or two trainers, all forms are collected. In addition to the Peace Corps forms, trainees are given two copies of a handout that lists the Grounds for Separation and the Assessment Dimensions for the program. They sign one copy and return it. The other copy is for them to keep in their personal files.

40 minutes
5. The Project Director (or visitor from Peace Corps) goes through the Peace Corps Policies with the trainees. Trainers participate by offering examples and observations from their own Peace Corps experience. Medical Policies are covered briefly (to be covered in more depth by the medical officer) and handouts on Malaria and AIDS (as well as any other handouts supplied by the medical office) are distributed.

15 minutes
6. Trainers should have refreshments (coffee, tea, soft drinks) available.

10 minutes
7. Each staff member introduces him/herself to the group, giving a brief description of his/her academic and work background and Peace Corps experience.

30 minutes (adjust based on size of group)
8. The Project Director or another staff member asks trainees to divide into pairs and spend ten minutes interviewing their partners. After the ten minutes, the group rejoins and each trainee introduces his/her partner to the group. Information provided should include (but not be limited to) the trainee's home state, university attended and academic major, country of assignment, and a brief statement about why the trainee first considered joining Peace Corps. Each introduction should be limited to approximately one and a half minutes, though usually they are shorter than that.

10 minutes
9. The Master Trainer or another staff member informs the trainees about the basic logistics of the program. Information to be covered includes:

- Emergency names and phone numbers or locations (for example, where to reach the medical officer, Training Director, Master Trainer, etc.);
- Trainees' mailing address and arrangements for outgoing mail;
- Phone numbers where trainees can be reached or messages can be left for them;
- Lodging (where) and meal arrangements (schedules);
- How shopping and other personal needs can be met;
- Arrangements for recreational activities, if appropriate (for example, safe places to jog, availability of a volleyball net or basketball court, etc.);
- Normal departure times of vehicles for routine training activities;
- Normal training hours.

40 minutes (Optional - See last point under Trainer Notes)

10. A. (5 minutes) Ask trainees to jot down some of the expectations they have about training. To help them with this suggest that they think about what they will need to get from/do in training in order to be effective overseas, and/or to think in terms of challenges they expect to face or skills they will need.

B. (20 minutes) Tell trainees that they will be breaking into small groups. Each group is to choose a recorder and a representative who will present their lists to the large group later. Within each small group, they are to spend 15 to 20 minutes discussing the lists of expectations they have as individuals, and compile a group list, on newsprint, of eight or ten main expectations that they have for training. After giving these instructions, indicate how the groups will be divided, and have them break up into those groups. (Groups should be of approximately five or six trainees each.

C. (15 minutes) A representative of each group comes up, one at a time, posts the group's newsprint and briefly runs through it, explaining the expectations listed.

15 minutes

11. The Master Trainer reviews the trainees' lists of expectations and addresses each point, giving some indication of whether or not the expectation is likely to be met during the training program. During this section, the Master Trainer can add other information relevant to the points being addressed. (For example, one trainee expectation might be that staff members will teach the trainees skills and share their experiences with the trainees. This would be an appropriate time for the Master Trainer to explain that, at least during the earlier part of the program, the trainers will not serve directly as technical resources and will not answer technical questions).

20 minutes

12. A. The Project Director or other staff member presents a general schedule for the ten weeks of training. It should be pointed out that this is a general overview of the flow of events, but that the actual schedule will be determined largely by the trainees' pace.

B. The Project Director makes some general statements about the program, including the following points:

- The program will cover all important aspects of fish culture, with some fine-tuning for the different countries;
- Most Peace Corps fisheries programs are very similar in terms of the concepts involved and the kinds of problems encountered, with only a small amount of variation in the necessary skills. This is why trainees who are going to different countries can receive their initial technical training together in a program that teaches basic, generic skills;
- Training may well be one of the more difficult things the trainees have ever done. We are accustomed to a teacher directed learning process, where there is an "expert" who supposedly knows all about the subject, all you need to know, and gives you this information. Here, we use a different kind of learning. Learning will be your responsibility. We are here to make sure this happens, to provide opportunities and make resources available. We're interested in developing skills, not collecting facts. The staff serves as facilitators rather than as instructors in a traditional sense;
- Tell trainees that expectations will be discussed again after the first week, once they have had a chance to experience the program for a while. At that time the staff's expectations of them will also be covered.

C. The Project Director discusses the assessment component of the program, and informs trainees that assessment will be discussed further after the first week. Included in this discussion is the emphasis placed on self-assessment, staff assessment of trainees, note-taking by trainers, and the schedule for personal interviews. It is also made clear that special interviews can be scheduled at any time upon the request of the trainee or staff. The Project Director briefly reviews the assessment dimensions and grounds for separation, making reference to the form the trainees received earlier.

D. (Optional - See last point in Trainer Notes) The Master Trainer explains the rules of the training program, pointing out that rules are nonnegotiable, unlike norms. He/she also recommends to the trainees that they get together to develop a set of norms among themselves. Norms are negotiable policies that will enable them to coexist as comfortably as possible. Suggested topics for norms include smoking in common areas, noise,lights out, sharing of responsibilities for keeping rooms, vehicles and work areas clean, etc. Rules may include:

- No smoking in classrooms or vehicles;
- No open alcohol in vehicles;
- Vehicles depart on time;
- Sessions, meetings, and activities begin on time;
- All training activities are mandatory unless otherwise specified;
- Unauthorized absence is grounds for administrative separation per Peace Corps Policy. A written request is required to obtain authorization to be absent;
- Trainees are to represent Peace Corps responsibly in the local community;
- Trainees are to follow the rules of Individual Training unless otherwise specified.

E. (Optional - See last point in Trainer Notes) The Master Trainer explains Individual Training, i.e., unless otherwise specified, all training activities should be considered to be individual. Individual training means that trainees work independent of one another, not independent of the staff, the training program, or other resources that become available. This is an extremely critical aspect of the training program. Reassure trainees that group activities and sharing of ideas will be built into the program as well, but that they will be notified about those activities as they occur.

5 minutes
13. The Master Trainer or another staff member makes announcements about what will follow for the remainder of the day, departure times for tomorrow, meeting time for evening slide show, etc. Included in these announcements is that trainees are to turn in any technical materials they brought with them to training. Explain that this is an important aspect of the program, reminding them of the comments made earlier about training being a different way of learning. Assure them that their materials will be returned to them later in the program. Designate a specific time and the staff member to whom they should give their materials. Ask them to bring two lists of everything they are turning in –one to be signed by the staff member and held by the trainee as a receipt, the other to be filed by the staff.

Resources and Materials:

- All staff members, including Project Director;
- If feasible, visiting Peace Corps officials (representative from OTAPS, Country Director, etc.) can provide a formal welcome from Peace Corps and help cover Peace Corps Policies;
- Comfortable meeting room, adequate chairs and tables;
- Prepared posters to be used during meeting. Suggestions include:
  - Overview of the organizational structure of the program;
  - The schedule for the day's meetings and activities;
  - Training Class I.D. Numbers and Project Codes (to help in filling out forms);
  - Trainees' mailing address and phone number while in training;
  - Emergency contact names, numbers, addresses or locations;
  - General ten week schedule, for example:
    Week One: Introduction to Peace Corps and Aquaculture Training
    Week Two: Introduction to Field Work and Fish Culture Concepts
    Week Three: Basic Pond Management
    Week Four: Surveying and Site Selection
    Week Five: Advanced Site Selection
    Week Six: Pond Construction and Extension
    Week Seven: Aquaculture as an Applied Science
    Week Eight: Fish Culture in the United States (refers to field trip)
    Week Nine: Country Specific Aspects
    Week Ten: Harvesting, Final Reports and Interviews;
- Flip chart stand and newsprint pads;
- Name tags;

- Polaroid and film;
- Markers, Masking tape, Blackboard, chalk and eraser;
- Extra copies of all mandatory and optional Peace Corps forms;
- Two copies per trainee of Grounds for Administrative Separation and Assessment Dimensions;
- Copy of Peace Corps Policies for Project Director;
- Medical handouts;
- Sign-up sheets for people who require eyeglass neutralization;
- Trainees' checks and sign-up sheets, if appropriate;
- Notebook paper and pens;
- Refreshments and supplies (i.e., coffee, tea, soft drinks, cups, spoons, etc.).

Trainer Notes:

- The logistics involved in this meeting are complicated. Every detail should be assigned to a specific staff member, and staff must be sure to walk through each detail the day before the meeting to be sure everything is prepared;
- All staff members should wear name tags. In addition, staff should be dressed neatly and somewhat formally;
- The visa photos that are collected are to be put on a poster in the office to aid staff in learning trainees' names as quickly as possible;
- Trainees should have received the Peace Corps forms in their invitational packets and should have arrived at training with all mandatory forms completed. However, it is very common for trainees to have forgotten them, never to have received some of them, or to have been confused by them. This is why staff should have copies of all forms on hand and should go through each form;
- Trainees who wear eyeglasses or contact lenses will need to see an optometrist for eyeglass neutralization. Providing a sign-up sheet during Orientation will enable staff to know how many trainees will require this, and facilitates scheduling of appointments;
- Handouts about some medical issues may be provided by the Peace Corps Medical Office and should be distributed, but staff should refer trainees who have questions about medical issues to the medical contractor or Peace Corps Medical Office;
- It is possible that trainees will have their first appointment with the medical contractor following this meeting. If this is the case, they should have been instructed to bring their WHO cards, if they have them;
- If the meeting will be followed by a shopping trip in town, provide some suggestions during the announcements, pointing out any relevant information about field conditions (for example, there are a lot of mosquitoes so they may want to purchase insect repellent, or the sun is very strong so they should have hats and water bottles, etc.);
- The trainer who is the contact person with the lodging staff may want to arrange a meeting in the evening to discuss the upkeep and rules of conduct for the lodging facilities;
- These sections are optional during Orientation. These sections can be covered in a separate session (see session entitled: Expectations, Rule and Norms) that follows the Orientation session, either in the afternoon of the same day or the morning of the following day. This will depend upon the day of the week upon which the trainees arrive and how the first day or two has to be scheduled.

Session I-3: Expectations, Rules and Norms

Total time: 1 Hour, 5 minutes

Objectives:

- Provide opportunity to share expectations about training;
- Promote understanding of trainer roles in training;
- Clarify rules and develop norms for training;
- Explain meaning and purpose of individual training.

Overview: Often trainees arrive without having given a lot of thought to training itself. Until now, many are likely to have been thinking more about actual Peace Corps service, speculating on what it will be like to live in a foreign culture or to be away from friends and family. In this session, trainees are encouraged to focus on what they expect, want and feel they need to get out of training. Comparing their expectations with those of their peers can serve both to alleviate some stress (there is comfort in finding that others share their hopes and fears), and to provide new food for thought regarding important skills or aspects training they may not have considered before. The staff will address the trainees' expectations, clarifying which are likely to be met, which probably will not be, and offering other comments that may help to explain and put into perspective some of the training methodology. This should help to establish a firm base, and should institute an atmosphere of trust that continues throughout the program.

10 minutes

1. The Master Trainer asks trainees to jot down, individually, some of the expectations they have about training. To help them with this suggest that they think about what they will need to get from/do in training in order to be effective overseas, and/or to think in terms of challenges they expect to face or skills they will need. It may help them to get started if the trainer throws out some questions such as, "What do you think you'll be doing? What will the staff be doing? What will be easy/hard? How will you learn?" If the trainer does choose to ask these questions, make it clear that they are just meant to help them think and that each specific question does not need to be addressed individually.

20 minutes

2.The Master Trainer tells the trainees that they will be breaking into small groups. Each group is to choose a recorder and a representative who will present their lists to the large group later. Within each small group, they are to spend 15 to 20 minutes discussing the lists of expectations they have as individuals, and compile a group list, on newsprint, of eight or ten main expectations that they have for training. After giving these instructions, indicate how the groups will be divided, and have them break up into those groups. (Groups should be of approximately five or six trainees each).

15 minutes

3. A representative of each group comes up, one at a time, posts the group's newsprint and briefly runs through it, explaining the expectations listed.

15 minutes
4. The Master Trainer reviews the trainees' lists of expectations and addresses each point, giving some indication of whether or not the expectation is likely to be met during the training program. During this section, the Master Trainer can add other information relevant to the points being addressed, and should explain the role of the trainers. Make it very clear that they will facilitate the learning process, but will not initially serve as technical resources. (For example, one trainee expectation might be that staff members will teach the trainees skills and share their experiences with the trainees. This would be an appropriate time to explain that, at least during the earlier part of the program, the trainers will not serve directly as technical resources and will not answer technical questions). If appropriate, explain again why trainees' technical materials were collected.

5 minutes
5. The Master Trainer explains the rules of the training program, pointing out that rules are non-negotiable, unlike norms. He/she also recommends to the trainees that they get together to develop a set of norms among themselves. Norms are negotiable policies that will enable them to coexist as comfortably as possible. Suggested topics for norms include smoking in common areas, noise, lights out, sharing of responsibilities for keeping rooms, vehicles and work areas clean, etc. Rules may include:

- No smoking in classrooms or vehicles;
- No open alcohol in vehicles;
- Vehicles depart on time;
- Sessions, meetings, and activities begin on time;
- All training activities are mandatory unless otherwise specified;
- Unauthorized absence is grounds for administrative separation per Peace Corps Policy. A written request is required to obtain authorization to be absent;
- Trainees are to represent Peace Corps responsibly in the local community;
- Trainees are to follow the rules of Individual Training unless otherwise specified.

The Master Trainer explains Individual Training, i.e., unless otherwise specified, all training activities should be considered to be individual. Individual training means that trainees work independent of one another, not independent of the staff, the training program, or other resources that become available. This is an extremely critical aspect of the training program. Reassure trainees that group activities and sharing of ideas will be built into the program as well, but that they will be notified about those activities as they occur.

In concluding the session, the Master Trainer can recommend that the trainees keep a journal to help them track own progress and watch their own reactions to various situations, etc. (Journals will be private and will not be seen by staff).

At the completion of this session, make any necessary logistics announcements. Take a fifteen minute break before moving on to next activity.

Resources and Materials:

- This is an important meeting and should be held in a quiet, comfortable location with no distractions;
- Newsprint, markers, masking tape and/or flip chart stand;
- Paper and pens should be available upon request.

Trainer Notes:

- The Master Trainer facilitates this session. It is important that the facilitator be someone with whom the trainees will have contact throughout training so they can easily request clarification or express concerns on the matters discussed here;
- Much of what is covered here can be missed by trainees since it foreshadows and attempts to explain confusing aspects of training that they have not yet experienced but about which they will later have many questions. It may be helpful to point this out to them during the session;
- During the explanation of individual training, there are likely to be some questions and some trainees may express disagreement or reservations. Facilitator must be prepared to discuss it and field questions until everyone seems to understand this rule. Make it clear that it is not negotiable and is taken very seriously. Encourage anyone who continues to have questions about this as training proceeds to request a meeting with the Master Trainer. It is important to discuss this openly, without becoming evasive or defensive, and to give some sense of why individual training is critical and how it will benefit the trainees in the long run.

Session I-4: Individual Focusing

Total time: ***1 to 4 hours, approximately***

Objectives:

- Allow trainees to concentrate on the specific professional demands of their jobs as PCV's;
- Focus trainees on what they will actually need to learn and do during technical training in order to be competent fish culture volunteers, allowing them to sort this out from other aspects of being a volunteer, such as those that will be covered in language and country specific cross-cultural training;
- Provide a transition from the "pre-training" they have experienced so far to the individual approach to technical training that will characterize training from this point on.

Note: This session follows the Expectations session or Orientation (if Expectations was incorporated) . Except for the brief, approximately five minute introduction, there is no set time frame for this activity as it is strictly individual and will vary among the trainees. An approximate time frame for the entire exercise is from one to four hours.

5 minutes

1. The facilitator (generally the Master Trainer) gives an introduction, reminding the trainees of what has been covered up to now and making a link between the Expectations session and this one. Point out that administrative business has been addressed, introductions have been made, and some time has been spent becoming acquainted with the area. There have been discussions on what training might be like, expectations of trainees have been discussed, and some of the ground rules and logistics of the program have been explained. Tell trainees that the staff thinks of everything up to this point as "pre-training". Now, if they are ready, actual "training" will begin.

Remind trainees that, as has already been discussed, training is fast-paced and can be hectic. Tell them this may be their last opportunity to really take some time to be alone with their thoughts and think hard about the questions about to be uncovered on the newsprint sheet that is hanging at the front of the room. Tell them that they may find the questions help them to get focused. Ask trainees to think about the questions and write down their thoughts. Point out that paper and pens are available up front. Tell them that after a while, trainers will come around and ask to read what they have written, and that trainers may ask to speak with them. Remind them that this is an individual exercise and they should not talk with one another.

2. Uncover newsprint. Newsprint has the following six questions:
   - Where are you going?
   - When you get there, what will the people expect of you?
   - What will it take for you to be effective?
   - Where are you now?
   - Why are you here?
   - What do you need to do here?

3. The staff sits quietly and waits approximately 30 to 45 minutes before circulating around room. If during this time a trainee appears to be finished and takes out a book to read, starts writing letters, or begins some other unrelated activity, a trainer should walk over and quietly and politely say something like, "That's not training, please put it away for now".

4. After some period, approximately 30-45 minutes, staff members begin to circulate and ask to read what the trainees have written. The staff should have previously divided the room among them so that each trainer works with certain trainees. The objective of the timing is to give everyone ample time to give more than a cursory response to each question, yet not to leave trainees sitting for so long that they become confused and get off track in addressing the questions from too many different perspectives, thus becoming scattered rather than focused. This is difficult to assess.

5. Trainers begin to meet individually with trainees (meet in a location outside of the room) to discuss what they have written. If a trainee has responded to the questions in a very abstract way or if the responses suggest that he/she is preoccupied with vague speculations about what life in a foreign country will be like, with innermost feelings about deciding to join Peace Corps, or is otherwise not yet at a point of focusing on the job at hand in technical aquaculture training, the trainer should spend a few minutes talking with the individual, then send him/her back to the classroom (see Trainer Notes for more specific suggestions).

6. When the trainer feels that the trainee has focused in on spending the upcoming ten weeks on learning the specifics of aquaculture so that he/she will be able to be an effective, professional and credible aquaculture extensionist, the trainer gives the trainee a training notebook and guides him/her to the next activity (Pond Observation Exercise).

Resources and Materials:

- Comfortable classroom for the group, with other meeting areas nearby for individual meetings between trainers and trainees;
- Newsprint or poster prepared with the questions listed above;
- Flip chart stand or tape;
- Notebook paper;
- Pens;
- Binders (at least 1 1/2 inch diameter rings), one per trainee;
- Dividers for binders (one packet per trainee).

Trainer Notes:

- This component is a modification of an exercise that has been controversial since Peace Corps aquaculture training began. In past programs, it was extremely ambiguous, i.e., trainees received no instructions and very little guidance. Rather than feeling focused as a result of the exercise, some trainees felt even more confused, and viewed the exercise as a "mind game". Over the course of the three years that the University of South Carolina conducted the training, several modifications were made in an attempt to find an approach that retains the value of the exercise, but eliminates the negative repercussions. Although the exercise remains controversial, the design presented here is one that we feel worked well. Some trainees still claimed that it was a "waste of time", but the majority felt that it had value for them, and was very helpful to provide this opportunity for trainees to prepare themselves and focus their concentration for training. Those who did not consider it useful, while not appreciative, at least did not seem to harbor the same type of bitterness that was the norm for many in earlier designs;

- The skills and attitudes of the staff have a tremendous effect on what the trainees gain from this exercise, on their feelings and attitudes, and on the trust they will feel towards the staff and the program. It is imperative that the staff spend a good deal of time discussing this exercise and that everyone on the staff has a clear understanding of its purpose. They should spend as much time as possible practicing, through role playing, to develop their techniques and learn about their styles before actually beginning to interact with the trainees;
- Properly implemented by the staff, this exercise should be perceived by the trainees as a helpful, positive experience. The staff's attitude toward the exercise will do much to determine its success;
- Each trainee will approach the questions differently. Often, trainees with a strong technical background will already be thinking in terms of further developing their technical skills, and will jump right in with ideas about raising fish. In many cases, trainees with weak science backgrounds express some fears about their ability to learn the technical skills, and often they will even avoid the whole technical issue, concentrating their responses instead on their personal feelings about working in a developing country, experiencing culture shock, etc. As with all generalizations, however, there are plenty of exceptions, and in reality their will be a wide range of largely unpredictable responses;
- While there are no "right" answers, there is a set of ideas that it is hoped will result from these questions. Trainers should not be rigid in requiring exact wording or in trying to get every trainee to go through an identical thought process, yet they should try to guide the trainees toward these bottom line ideas. Following are the kinds of responses it is hoped trainees will eventually reach to the posed questions:
    - **Where are you going?** This is a grounding question, and the trainee should be encouraged to give a simple, straightforward response, stating the country to which he/she has been assigned;
    - **When you get there, what will the people expect of you?** Though the trainee might initially respond to this in a wide variety of ways ("They'll expect me to be very rich", "they'll expect me to ride a horse and carry a gun", "they'll expect me to speak their language", etc.), the objective is to direct the trainee towards thinking in terms of his/her professional role and the responsibilities he/she will be expected to fulfill in light of that role. Thus, what is being aimed for here are responses such as "They'll expect me to be an expert in fish culture", "They'll expect me to be able to answer all their questions and solve their problems related to raising fish", "They'll think I know everything about fish culture", etc.;
    - **What will it take for you to be effective?** Trainees may have initially reacted to this question by thinking mainly about cultural sensitivity and language skills. These are certainly valid responses and should be acknowledged as such, but again try to direct them towards other aspects of being effective in a professional

role. A main concept to try to get across here is the importance of being able to establish professional credibility. For example, "I'll need to know what I'm doing, and people will need to believe that I know what I'm doing", "I will need to be competent, and confident enough in my own knowledge to gain the trust of others", "People will need to perceive me as a credible professional", "I will need to present myself in a professional manner", etc.;

- **Where are you now?** This is another grounding question that serves as a reference point for the next question. Again, encourage a very straightforward response. They are at the Peace Corps Aquaculture Training Program;
- **Why are you here?** Some trainees will respond to this by discussing their reasons for joining the Peace Corps. This is an important personal process for some trainees, and if it seems appropriate, the trainer may take a little time to discuss it with them. But to help the trainees with the focusing process, ask them to answer in light of question number four. Help them to distinguish specifically that they are at the Peace Corps Aquaculture Training Program, rather than simply in Peace Corps or in a particular country. They are here in order to learn about raising fish and to develop the technical skills and expertise needed to be effective as fisheries volunteers;
- **What do you need to do here?** The response to this, again, is sometimes self-reflective and abstract. For example, "I need to work hard and listen to the instructors". What should be encouraged is a more tangible, directly job-related response, such as "I need to get experience raising fish", "I need to learn to raise fish by actually doing it", etc. This question can be used to get at the idea of learning through experience being the most effective way of learning. However, care should be taken here. In the past, the question posed was a different. It was, "What do you need to have?", with the objective being for the trainee to request a pond. (This was based on a modification of a previous approach to this exercise from earlier programs). Rigidly requiring that a trainee make this request seemed to be a key contributor to the frustration trainees experienced in this exercise. For many, the idea of jumping into a completely hands-on situation before receiving the more familiar type of preparation through lectures, readings and demonstrations is a completely foreign one, and will not even be considered. If the trainer simply hints around until the trainee is practically forced to say what the trainer wants to hear, it triggers resentment, mistrust and a sense of "playing a game". If the trainee feels that the best way to learn fish culture is through receiving lectures, reading books, and then trying to apply the learnings under the direct instruction of the trainers, that is a perfectly reasonable line of thinking even though it is not the way training is conducted in this program. In fact, all of those methods of learning do occur in training, but not in the order that is likely to be the most familiar to the trainee. Thus, the trainer should not devalue or ridicule that suggestion. When the interview with the trainee reaches this point, a better approach is for the trainer to help the trainee see some of the advantages of having the opportunity to develop clear questions in order to recognize and be able to utilize helpful information that may become available, and also point out how learning a skill through actual experience impacts on the level of resulting confidence in one's abilities;

- The staff guides the trainees through this process through one-on-one interviews. Analogies can be useful tools in helping trainees think clearly about questions 2,3,5 and 6. It is extremely critical that trainers really read what the trainees have written and listen carefully to what they say. This will help the trainer to determine an approach that is consistent with the trainee's own thought process. In addition, it is easy to miss a point that has already been made and/or clearly understood by the trainee, and then throw that individual completely off track in trying to guide him/her toward the same idea. This is extremely frustrating to the trainee, since without realizing it, the trainer may have given the impression of dismissing that idea as unimportant;
- The manner and attitude of the staff has a great impact on how the trainee feels about this experience and on the value of the exercise. Although it is true that there is a set of ideas that are being sought in the responses to the questions, there are really no "right" or "wrong" answers. The staff should be very careful not to get so caught up in their own objectives that they give the impression that the trainee's answers are "wrong" or "bad", or come across as angry or impatient. This is a very individual exercise, and the way trainees respond will be as varied as their individual personalities. Since the goal is to help them focus, much will depend upon their individual states of mind as they enter the program. Some may already be thinking about what they want to feed their fish, while others may still be grappling with personal issues related to leaving home for two years. Staff members must be sensitive to this and must make every effort to make this exercise a positive, helpful one.

Session I-5: Pond Observations

Total Time: 8 to 15 hours (time will vary according to individual progress)

Objectives:

- Sharpen observation skills;
- Build trainees' confidence in their ability to learn independently through their own observation and deductive reasoning;
- Give trainees opportunity to identify their own perspectives, habits and biases in observing something for the first time;
- Begin developing an eye for various physical characteristics of a pond system;
- Familiarize trainees with work area.

Overview: Up until this point, sessions have been designed to orient the trainees, prepare them for the program and help them set broad goals for training. This is the first actual technical exercise in the program. The trainees will be required to make very thorough and detailed observations of the entire pond system area and to record those observations in an organized way. They will have the opportunity to try to draw connections and conclusions about what they observe. In addition to learning about the system, they will develop many questions about fish ponds and aquaculture that they will be encouraged to write down and explore over the course of training.

Trainer Note: If trainees have not yet received their training notebooks (empty binder, paper, dividers), they should receive them before beginning this exercise. The trainer should stress that the notebook should be built into an extremely valuable resource for the trainee to take overseas. The trainee should think of it as a comprehensive textbook that he/she will write for him/herself.

5 minutes

1. Instructions are given to the trainees individually. Instructions may be given at the classroom or wherever the trainee is at the point of completing the previous exercise. The trainee receives the following instructions:

- You will be given directions to the pond area, and the boundaries in which you are to work will be specified;
- Please investigate this area very carefully, record all of your observations in detail, and make comments on what you see. Use diagrams when appropriate;
- A trainer will check with you from time to time to see how you are progressing;
- Please remember that this is an individual training activity. (Refer to discussion of individual training that took place during the Expectations session).

When giving instructions, the trainer should also include any restrictions (i.e. do not enter buildings, do not throw switches, etc.) as appropriate, and any necessary warnings (i.e. there are poisonous snakes in the area, bring drinking water, etc.). Once the instructions have been given, the trainer directs the trainee to the pond area.

8 to 15 hours
2. Trainees work independently in the field, making their observations and notes, and eventually receiving input and guidance from trainers. Trainers are out in the field observing the trainees, but should not interfere with them unless a trainee needs to be reminded of a given restriction or is in danger of harming him/herself or a piece of equipment. When a trainee who has been working for quite a long time and writing down a lot of notes appears to have slowed down or reached a block in his/her thinking, the trainer approaches and asks to see the trainee's notes. This is the point at which the trainer must exercise judgement in determining how much guidance to give the trainee.

The number of times the trainer confers with the trainee over the course of the observations will vary, and at some point, the trainer will determine that the trainee has done a thorough and complete enough job to move on to the next exercise. The attached list of observations can serve as a guideline, though it is not imperative that every single point on the list be included in the trainee's notes as long as the appropriate level of detail has been reached in most areas and all general categories have been noted. A map of the ponds is required.

10 minutes
3. The trainee completes the exercise and is given directions for moving on to the next step. The trainer has a short discussion with the trainee during which the amount of work the trainee has done should be acknowledged, and the trainee is encouraged to recognize the amount of progress that he/she has made. It should be made clear that although the trainee has done a good job of making increasingly thorough observations, he/she has not necessarily seen all there is to see and will probably continue to see and learn more as experience is gained working at the ponds. The trainee is then told that the observation notes will be the first section of the training notebook. The trainee is instructed to put the notes into a neat and organized form so that they will be useful in the future. The notes are to be turned in the following day for the staff to look over, then returned to the trainee to be put in the notebook. At this point, the trainer guides the trainee to the next step.

Materials/Resources:
- Notebooks, pens;
- Insect repellent (if appropriate);
- A pond system that includes several ponds, a water supply and a drainage system. The more variety and features the area provides, the richer the exercise will be. Different types of water sources, ponds of different sizes and construction, a variety of soil types and vegetation, and support facilities such as holding tanks, settling tanks, etc. all add to the value of this activity. A few other suggestions: Have some ponds full and stocked with fish, some full of water but without fish, some empty and dry. Fertilize some ponds several days prior to the exercise, fill others shortly before the exercise so there will be a variety of water colors due to different levels of plankton blooms. Have a few pieces of equipment such as seines, cast nets or cages in sight. If possible, ponds should have examples of different types of inlets or drainage structures such as sluices, standpipes or monks.

Trainer Notes:

- This exercise serves as an initial transition to the methodology employed by the training program. For most trainees, the way learning occurs in training is a departure from their previous educational experiences. The assignment often seems ambiguous to the trainees, and some will feel overwhelmed as they begin the task. Although they will not receive direct input or verification from trainers on the accuracy or completeness of their observations or conclusions, trainers will provide some guidance regarding each trainee's approach to the task. As they work, they will notice improvements in their own observation skills. While some will be frustrated initially, trainees discover a great deal about their own strengths and skills and gain confidence in their ability to learn independently;
- Prior to going into the field, each trainer should have previously been assigned certain trainees with whom he/she will work throughout this exercise. To avoid confusing trainees, trainers should not provide guidance to trainees to whom another trainer has been assigned unless the trainee has a specific logistical question. If a trainer has to leave the area, he/she should bring another trainer up to date on the progress of the trainees with whom he/she has been working so that the other trainer can take over effectively. Consistency among trainers is critical to ensure a positive, supportive process;
- There are many ways in which the trainer may give the trainee guidance, and the type and amount of help given will depend on several factors, including the amount of information the trainee has already accumulated, the depth of detail of that information, and the confidence level and enthusiasm of the trainee. The trainer should be creative in using analogies and other techniques to help the trainee find a way to continue the exercise. Some possibilities and suggestions:
  - Often the trainee has stopped "seeing" things because he/she is looking at the area from a limited perspective. For example, a geology major may have made a thorough survey of soil types, but may have completely missed the variety of vegetation, the fish in the ponds, or a net lying on the bank. A biology major may have diagrammed every plant, tree and insect, but not even noticed the plumbing system. In this situation, the trainer can help make the trainee aware of his/her "bias" by asking that individual how a plumber, farmer, real estate agent, zoologist, etc. might describe the same area;
  - Some trainees get caught up in details and miss the "big picture". For example, they may overlook the general topography of the area or the fact that there is a system rather than several independent ponds. Other times, just the opposite is true. In the first case, encourage the trainee to "zoom out", or ask the trainee to imagine that he/she has been hired by a potential buyer in another state who is counting on the description the trainee will provide to determine exactly what the area looks like. In the latter case, where more detail is needed, choose one thing in the trainee's notes, perhaps a drainage structure or individual pond, and ask the trainee to provide enough detail for someone to be able to build a similar drainage structure or pond from those notes, or to see exactly what the trainee sees, without actually having to visit the site;
  - In some cases, the trainee will have a tremendous amount of information, but in such a scattered form that he/she does not recognize relationships or has major

gaps. Here, the trainer should encourage the trainee to organize the notes and to categorize the observations in a logical way;

- Often trainees who do not have a science background feel that they are at a disadvantage and lack confidence in their ability to see what they think they should see, or make sense of their observations. A trainer can help by pointing out the progress the trainee has made over the course of the exercise and giving some reassurance of the value of the observations that have been made so far;

- **Important!** Trainers must remember that this is an exercise in observation, not a test of knowledge in aquaculture. While trainees should be encouraged to think about what they see, try to draw some conclusions and make connections, it is not necessary that they understand the function of everything they see or draw only correct conclusions at this stage. While a trainee who majored in aquaculture may know the correct terminology for and functions of certain structures or equipment, other trainees will not. A caution here is that the trainer must not give the impression that speculations made by the trainees are correct, but should just encourage the trainees to write down their questions and ideas so that they can refer back to them later as more knowledge and experience is accumulated.

Sample list of observations that reflect the level of expected detail:

- Construction
    - Dike sides are sloped
    - Dike widths
    - Pond bottoms are sloped
    - Water depth at shallow and deep ends
    - Drain at deep end
    - Pond size at ground level, water level and in bottom of pond
    - Water depth in various ponds
    - Depth from bottom to ground level in various ponds
    - The site is on slope, direction of slope
    - Certain places around ponds have been built up
    - Grass is planted on dikes, type of vegetation on banks
    - Grass or other vegetation on pond bottom
    - There are a variety of soil types (colors, textures, sand, clay)
    - Dikes in some ponds eroding
    - Cracking in the bottom of some dry ponds
- Water System
    - Pump (all specifications on labels)
        - Where tubes go in, where tubes go out
        - Power source
        - Motor unit is separate from pump unit
        - Log sheet
        - Various tools in pump house
        - Construction of pump house
        - Grease on grease points
    - Inlet piping
        - Location of inlet piping in each pond
        - Location of valves, how valves work
        - Pipe material and size

  - Source of water
    - Depth and width of canal
  - Drainage
    - Location in ponds
    - Type and size of pipe
    - Main system outlet locations
    - Drainage area and canals
    - Description of drainage device
- Site/Environment
  - Birds, other predators or signs of them
  - Distance to town, roads
  - Surrounding vegetation
  - Buildings, structures
  - Directions (north, south, east, west)
- Individual ponds (for each pond)
  - Color, turbidity
  - Presence of fish
  - Depth of water
  - Films and debris on surface
  - Presence of other animal life
  - Erosion/vegetation on banks.

Session I-6: Processing - Pond Observations

Total time: 1 hour, 5 minutes

Objectives:

- Share feelings experienced during the Pond Observation exercise;
- Discuss Pond Observation exercise from non-technical standpoints including learnings about trainees' own reactions, problem-solving approaches and perspectives;
- Share some of the technical observations made about pond systems;
- Apply this experience to the development of strategies for observing unfamiliar pond systems;
- Develop clear, specific questions based on knowledge gained from this exercise.

Overview: The Pond Observation exercise is the first technical exercise in the program. It involves working individually and dealing with a fairly ambiguous task, a very new kind of challenge for many trainees. In addition to its technical aspects, this exercise provides an adjustment period for the trainees and a transition to a new way of learning. In processing the Pond Observation exercise, trainees have an opportunity to share some of their feelings while going through this adjustment, and to think about what they learned about their own reactions to new situations, as well as how they approach problem-solving. In addition, this session helps clarify and reinforce some of the technical learnings, and provides an opportunity to think about the application of these learnings to future situations.

5 minutes

1. The trainer briefly reviews what happened during the Pond Observation exercise, and tells the trainees that, in this session, they will have a chance to discuss the exercise.

5 minutes

2. The trainer points out that there were actually many aspects to this exercise, and asks the trainees from what standpoints it could be discussed? (For example: technical, dealing with frustration/ambiguity, observation skills, approaches to problem-solving, working independently, working in physically demanding conditions, etc.) The responses of the trainees are recorded on the board or newsprint.

15 minutes

3. Once there is a list on the board, the trainer assigns some order to them for the following group discussion, going from the non-technical aspects to the technical ones. The trainer then facilitates a group discussion among the trainees to allow them to share their experiences related to each of the aspects listed. The trainer can pose some of the following questions to stimulate the discussion:

- How did they feel when they first went out into the field? (frustrated, bewildered, confused, nervous, lonely?);
- What were some sources of frustration?
- How did they deal with or react to what they were feeling?
- Did they set goals?
- How did they go about developing a way to tackle the job?

- What did they learn about their own observation skills?
- What did they learn about their own perspectives?
- How many looked at the area from the point of view of their academic background or other experiences? (Ask for examples of people seeing something, but not seeing something else. For example, "I saw all the different species of plant life but didn't even notice the pipes going into the ponds");
- How long did it take before you looked at the ponds as a system?

5 minutes
4. The trainer asks the trainees to individually write down three to five things they learned about fish ponds based on their observations that they didn't know before.

20 minutes
5. The trainer tells the trainees that they will be dividing into small groups (four to six trainees per group). Once in their groups, they have a two part assignment. They are to spend the first ten minutes comparing the things they wrote down about what they learned about fish ponds. They are to spend the second ten minutes developing, as a group, a strategy to address this question:

- If you were to go visit a pond system now that you had never seen before, describe, step-by-step, how you would go about studying it, and briefly give the reasons for each step.

The strategy each group develops should be recorded on newsprint.

10 minutes
6. The large group reconvenes and a representative of each small group presents their group's strategy.

5 minutes
7. The trainer gives the following homework assignment, to be turned in the following morning, then returned to the trainee to keep in his/her notebook: List fifteen questions you now have as a direct result of your observations of the pond system you studied.

The trainer concludes the meeting by making a few final points to remind the trainees that, since most of them are still unfamiliar with fish ponds, haven't yet fully developed their "eye", and still lack a great deal of technical information, they had to make some assumptions in processing what they observed. This is an important first step that assigns some order to their thought processes, but they should be sure to make a point of taking opportunities to test their assumptions and verify the accuracy of their conclusions as they go through training and gain more information. They should also be encouraged to recognize how much they were able to learn on their own, and to note their own progress and accomplishments as they went through this exercise.

Resources and Materials:
- Blackboard, chalk, eraser;
- Newsprint pads, markers, masking tape.

Trainer Notes:

- This occurs early in training at a point where trainees may still be unclear about the Individual Training aspect of the program. To avoid confusion and/or mixed messages, it may help to acknowledge this. The trainer can remind the trainees that they were told in orientation that training is individual unless otherwise specified and that they were told there would be opportunities to share ideas built into the program. Point out that this meeting is one of those times, but that once leaving this session, individual training is to be resumed and the subject matter covered here is not open for further discussion among them;
- An alternative approach to processing the Pond Observation exercise is to do it with small groups of trainees as they complete their observations. In this case, the processing takes place every time about four to eight trainees have completed the observations. The design remains essentially the same, except that in step number five it will probably not be necessary to break into even smaller groups (if there are more than six trainees, however, it may be worthwhile to break into groups of four or five). Although this approach is labor intensive for the Master Trainer (or whichever staff member is facilitating the processing), it has been very successful since it provides more immediate processing, thus making the trainees aware of the value of the exercise while it is fresh in their minds and other activities have not superseded this experience.

Session I-7: Personal Interview - Week One

***Time Frame:** Average approximately ten minutes per trainee, but varies greatly.*

Objectives:

- Welcome each trainee to the program on an individual basis;
- Allow staff members to become acquainted with each trainee on an individual basis;
- Provide opportunity for trainees to express any concerns, thoughts or questions they may care to share with the staff;
- Allow the staff to learn, on an individual basis, what each trainee expects, hopes or wants in terms of his/her personal experience in training.

Overview: The first personal interview takes place as early as possible, usually around the middle or end of the first week. It is usually very short, just meant to establish a personal contact with each trainee and to provide an opportunity for trainees to share anything they wish to discuss with the staff. The actual length and content will vary considerably based upon the trainee's input. The Master Trainer conducts each interview, preferably with a trainer present as well. Feedback is very rarely shared during this interview.

There is not a set process for these interviews, as what occurs is strictly dependent upon the individual trainees. The following is a suggested approach that can be taken by the Master Trainer, with some sample questions that can be asked to initiate conversation.

The Master Trainer greets the trainee and explains that the first personal interview is simply meant to provide an opportunity to welcome each trainee individually, and to make an individual contact with each person. He/she can say that often trainees have questions they would like to ask or things they would like to discuss with the staff, so this also serves as an opportunity to address anything the trainee would like to talk about.

After those introductory statements, the Master Trainer might ask the trainee some of the following questions:

- What were you doing right before you came to training?
- What are your impressions so far?
- Based on what you have heard and seen so far, what do you anticipate as being some of the more interesting/valuable/difficult/easy aspects of the program for you, personally?
- What are some of the things you plan to work on and/or most hope to get out of training?
- Do you have any questions, concerns or comments you would like to discuss?
- In future interviews, we will be giving you feedback on your progress here. Are there any particular areas in which you are especially interested in receiving feedback?

In closing the interview, the Master Trainer should tell the trainee that future interviews will be structured somewhat differently. They will be more formal and structured, there will usually be a trainer present as well as the Master Trainer, and there will be more discussion of the trainee's work and progress, including feedback on the trainee's performance. The

Master Trainer should also point out that the trainee never has to wait for a scheduled interview to talk with staff members, and is welcome to request a special interview with any staff member at any time.

Trainer Notes:

- Since these interviews often take place during Pond Observations, it is possible that trainers, occupied with trainees in the field, may not be able to attend these interviews. In this case, the Master Trainer conducts them alone, but can tell the trainee that trainers will be present in future interviews;
- This interview, since it is less formal than future interviews, can be held outdoors as long as there is a private, reasonably comfortable place to meet;
- After the trainee leaves, the trainer should note down some of the major points that came out during this interview. This is important because concerns or requests expressed may be of the sort that should be addressed again in later interviews. For example, if a trainee is still feeling very unsure about the decision to join Peace Corps at this time, it will be important to check back with him/her later in the program. If the trainee has requested feedback in a particular area, the staff should make a point of making the kinds of observations that will enable them to provide that feedback in future interviews.

Session I-8: Processing of Week One - Bridge to Peace Corps, Goal Setting

Total time: 1 hour, 30 minutes

Objectives:

- Process the week's activities by providing opportunity for trainees to share experiences and feelings;
- Share ideas about new ways of learning based on experiences in first week;
- Define the purpose of training in the context of service in the Peace Corps aquaculture programs and of what will be expected of trainees upon arrival in those programs;
- Discuss and provide information about the role of aquaculture Volunteers;
- Provide opportunity to consider the assessment component of the training program in the context of the needs of Peace Corps field staff;
- Inform trainees about the expectations the training staff have of them;
- Encourage trainees to set personal goals for training.

Overview: This meeting takes place at the end of the first week, and serves several purposes. The first week of training can be a strange and intense experience for many trainees, and this meeting provides an opportunity to process that experience. After a week of individual work during which trainees may have felt alone and sometimes confused, it can be reassuring to share the feelings they had and to discuss what they learned about working in this environment. Some of the topics that were touched on in Orientation are reviewed again now that trainees have some experience with the program to help them put them into perspective. In addition to processing, this meeting also serves as a forum for providing additional information about the job of a fish culture extensionist that will help trainees put training into context. Trainees are informed of the staff's expectations of them. Finally, now that trainees have had a chance to get oriented, they are encouraged to set personal goals for themselves related to the training program.

10 minutes
1. The facilitator begins the session by reviewing what the trainees have done over the course of the week. He/she asks the trainees to share some of the experiences and feelings they had during the week.

15 minutes
2. The facilitator asks trainees to list what they have learned about new ways of learning. As the trainees respond, a trainer records their list on newsprint.

10 minutes
3. When the trainees feel that the list is complete, the trainer tapes the sheets of newsprint along the front of the room. The facilitator asks the trainees to take ten minutes and write down how they plan to apply what they have learned this week to the rest of training.

15 minutes
4. At this point, the facilitator gives a brief lecture during which the following topics are discussed:

- The organizational structure of Peace Corps (in terms of the aquaculture programs) including the roles, relationships and interactions among Peace Corps/Washington, Peace Corps field staff, host government agencies and other development and/or private volunteer organizations involved in aquaculture programs;
- A more detailed description of the role of the Associate Peace Corps Directors (or field Project Manager), and his/her working relationship with the Volunteers;
- The role of the aquaculture Volunteers in the Peace Corps aquaculture extension programs overseas, including information about the programming strategies and how volunteers fit into the different stages of aquaculture development as fits the planned program design.

10 minutes

5. The facilitator asks the trainees what they feel are some of the important skills and characteristics that a volunteer must possess in order to be effective. Encourage the trainees to make links between these skills or characteristics and the job of the fisheries volunteer, and to explain how each point affects the volunteer's effectiveness.

10 minutes

6. The facilitator now asks the trainees to turn their thoughts, in light of what has been discussed to this point, to what the Peace Corps field staff will expect of them. Again, this is to be a verbal discussion among the trainees.

10 minutes

7. At this point, the facilitator refers to the assessment component of the program that was initially introduced during the Orientation session. He/she stresses that the main purpose of this component, as well as the dimensions that are used, are based on the needs of the overseas staff regarding the volunteers who enter the fisheries programs. The importance of honest self-assessment is again emphasized with reference to its relevance to the aquaculture programs. Trainees are encouraged to express their thoughts or questions about either self-assessment or staff assessment.

5 minutes

8. The staff's expectations of the trainees are explained. These include:
   - Honest self-assessment;
   - High level of commitment and effort;
   - Very high quality work;
   - Trainees take responsibility for their learning;
   - Trainees take advantage of opportunities;
   - Trainees are on time and prepared for all activities;
   - Openness to giving and receiving feedback;
   - Trainees take responsibility for their own health and well-being;
   - Keep an open mind, take risks, suspend cynicism, do not fear failure;
   - Participate actively;
   - Sensitivity to the image of Peace Corps in local community;
   - Take responsibility for maintaining facilities, equipment, etc.

5 minutes
9. In concluding the session, the facilitator points out that training can serve as a transition period for developing and enhancing the characteristics they listed and for trying out what for most will be a new role. The trainees are given an assignment to reflect upon what has been discussed and upon their own past experiences, and to set some personal goals for themselves for training. These are to be written down and turned in the following morning. Make it clear that the goal statements will be returned to them within a day or two and they may be referred to in future feedback sessions.

Resources and Materials:

- Newsprint;
- Markers;
- Flip chart stand;
- Masking tape.

Trainer Notes:

- This session can be facilitated by the Master Trainer, the Project Director, or Project Manager. It can also be co-facilitated by some combination of a regular training staff member and/or the Project Director, and a visiting official such as an Associate Peace Corps Director or the other Peace Corps staff;
- The timing of this session is important. It should be scheduled at the end of the first week. However, it is also important to consider what other activities the trainees are involved in. If trainees are in the midst of stocking their ponds, for example, it may be difficult to get them all together at a time when they will really be able to focus on the content of the session. If it is more likely to have the trainees' full concentration and attention a day earlier or the first morning of the second week, this should be considered.

CHAPTER ELEVEN

PROGRAM DESIGN - WEEK TWO

Session II-1: Management Plan (Part One)

Total Time: ***Approximately 2 hours structured time followed by individual time frames.***

Objectives:

- Set goals for fish pond management component of training;
- Develop a detailed set of plans for the management of the trainee's pond;
- Begin to learn basic concepts of fish culture through application of previous knowledge and experiences;
- Practice using brainstorming, deductive reasoning and analogies as problem-solving techniques.

Overview: At this point, trainees have just been assigned the ponds that they will stock and manage throughout the remainder of training. Before they can begin working with the ponds, they must develop goals and a set of plans which they can follow to meet those goals. It is at this time that the trainees really begin to think of themselves as fish farmers and to gain insights into the concerns and activities of fish farmers. Development of management plans is a critical part of training because many of the most important, most basic concepts of warmwater aquaculture are explored during this activity. The trainees do not receive any actual technical information, and though they do receive guidance from trainers, they are obliged to use their own experiences, previous knowledge, best judgement and common sense in order to develop these plans. As various parts of the management plans are developed, the trainee is given permission to begin implementation of those parts. For now, the plans they develop just provide a starting point. Several sections of the plans are never really finished. The trainee will continue to revise and supplement them as they gain new knowledge and see the results of their management practices.

20 minutes

1. A trainer facilitates a discussion to help trainees set goals for their pond work. Point out that the trainees should think as fish farmers as well as trainees. Have them come up with two separate statements, one as a trainee and one as a fish farmer. The Trainee Goal should address using the pond to maximize their learning about fish culture. The Fish Farmer Goal should address raising fish at a profit. Point out to the trainees that writing these down as two separate goals is important because they will need to reflect upon their goals when making management decisions, and the decisions they make as trainees may not always be consistent with the decisions they make as fish farmers. The actual choices will be theirs, but it will be helpful to acknowledge that they are wearing two different hats simultaneously so that they can make their decisions with a clear understanding of their own reasoning.

1 hour and 40 minutes, variable
2. Once goals have been set, the trainees will need to make plans for the actual management of their ponds. After this point, they work with trainers on an individual basis rather than in a group. Have them begin by brainstorming a list of all of the activities they think will be involved in fish farming. Once they have this list, have them organize the items into some logical order and write an outline for the management plan. This outline should include sections on:

- Pond preparation;
- Stocking;
- Fertilizing (optional at this point - see Trainer Notes);
- Feeding;
- Sampling;
- Water quality monitoring;
- Physical pond maintenance;
- Harvesting;
- Marketing;
- Accounting/Economics.

Individual time frames
3. Once the trainee has an outline that includes the topics listed above, the trainer tells him/her that each item in the outline should be considered a major section of the plan. (In effect, the Management Plan is really a set of smaller plans that together comprise the overall plan to manage the pond). Suggest the use of separate pieces of paper for each part, making each part of the plan a separate notebook section. The trainee should fill in each section with as much detail as possible. The trainers provide direction at this stage regarding the order in which the trainee should develop the sections. Have trainee begin with sections on Pond Preparation and Stocking. Trainees should work closely with their trainers throughout this process.

4. Based on the amount of detail in the plans, logistics, scheduling and staff judgement, trainers allow trainees to begin implementation of certain sections of their management plans.

Resources and Materials:

- Blackboard and chalk (or newsprint and marker);
- Notebook paper;
- Pens;
- Comfortable work area (classroom) and area for individual meetings between trainers and trainees.

Trainer Notes:

- The flow of the discussion about goals will be influenced by whether or not a group discussion about fish farming for profit has already taken place. If it has not, the discussion may take longer. Some trainees will be much quicker than others to think in terms of farming and profitability. It is important to be sure that sometime during the course of this meeting, trainees realize that aquaculture is a form of farming rather than fisheries management, and that concerns of a fish farmer are similar to concerns of any other farmer. For some trainees, this will be a difficult concept to grasp especially if they are caught up in thinking about working in a developing country and are clouding the issue with their own preconceptions about the goals of farmers in developing countries as something separate from goals of farmers in developed countries. The way in which the trainer has to handle this depends in part on whether the training program is taking place stateside or in-country, but at some point trainees should be given food for thought about the reality of whether or not a farmer will continue to farm if a profit in some form does not materialize. Some trainees will resist this idea, especially if they have a negative emotional reaction to certain terms (i.e. profit, money, capitalism). Allow some discussion and arguing, within a reasonable time frame. Most trainees will at least agree that, as farmers, they want to maximize output for minimum input;

- Having trainees come up with two separate goal statements, one "Trainee Goal" and one "Fish Farmer Goal" is a change from previous training programs. The reason for this is to avoid confusion and mixed messages later on as trainees actually work with their ponds. In the past, trainees were encouraged to set their goals strictly as fish farmers. Having them think in these terms is very important and a critical aspect of training. However, it is impossible to ignore the fact that as inexperienced trainees, they cannot realistically think and act strictly as fish farmers independent of the situation in which they are actually working. As trainees, their ponds are the most valuable tools they have for learning about the dynamics of a fish pond and experiencing the effects of various management practices. In this respect, they are encouraged to take some risks with their ponds to really maximize the learning that can be obtained from the pond work. A fish farmer whose first concern is making a profit, maximizing output for minimal input, will only be willing to take a certain amount of risk, especially without substantial experience. For example, while it may be wise for a trainee to experiment with a variety of fertilization or feeding techniques, a real farmer may not be at liberty to do so. Also, since a farmer must keep costs to a minimum, some steps may be cut out that a trainee should take. For example, an experienced farmer will balance the amount of water quality testing done against the cost and what can be predicted based on experience. A trainee, on the other hand, would be seriously limiting the learning process if he/she decides not to take numerous water quality tests in order to track cycles and learn about the effects of changes in weather, different types and quantities of feed and fertilizer, etc. By acknowledging at the beginning that the trainees are in a peculiar situation, it is hoped that they will be able to make conscious, calculated decisions, keeping both goals firmly in mind, without feeling frustrated or in a "Catch-22" position due to strong encouragement by staff to take risks but then feeling that they are failing as fish farmers because of those risks;
- Trainees should be divided among trainers for working on their management plans. They should know with which trainer they will be working, and there should be a lot of contact with the trainer throughout this process. Trainers should not work with trainees to whom another trainer has been assigned. If a trainer will be unavailable for an extended period, he/she should thoroughly brief another trainer on the progress of each trainee, and tell the trainees with which trainer they are to work during the absence;

- Development of Management Plans is a very critical component of the training program. Despite the fact that they have no access to information, trainees actually begin to think about many of the most important concepts involved in fish culture. Many trainees will be incredulous, and will make it clear that they think it is absurd, that they are expected to develop a working plan for something about which they feel they know nothing. This attitude, combined with the diversity of backgrounds and knowledge with which trainees arrive at training, make this component just as challenging and difficult for staff as it is for the trainees. It is during the initial stages of developing the Management Plans that a sense of trust between trainees and trainers can either be established or damaged. The skill and sensitivity of the trainer is therefore of the utmost importance. It is suggested that trainers practice among themselves through role playing and spend a lot of time discussing the problems they encounter and techniques they develop for working with trainees. Inexperienced trainers should sit in on discussions between experienced trainers and the trainees with whom they are working before beginning to work with trainees themselves;
- There is another point of caution that should be made to trainers. Working on management plans involves a lot of technical concepts which are very familiar and basic to the trainers, but which most of the trainees have not considered or put together in this way before now. The trainees may feel self-conscious or uneasy because of a real or perceived lack of knowledge. Because they are in a vulnerable position, trainees may easily misinterpret the tone or body language of the trainer. Trainers must be very sensitive to the feelings of the trainees and to their own actions to avoid inadvertently coming across as smug or impatient. A common reaction on the part of the trainers, as they experience sympathy for the trainees, is to be tempted to "spill beans" as a way of being nice or helpful. It is important that the trainer be extremely controlled and careful not to give in to this temptation as it can actually hinder trainees by discouraging them from being resourceful, lowering their sense of self-reliance , or robbing them of the sense of achievement they feel when they do solve a problem on their own. Trainers must be respectful, supportive, sensitive and at the same time uphold standards;
- The following are some suggestions and points to keep in mind while working with trainees on Management Plans:
  - Try to help trainees draw on their own experiences and previous knowledge by helping them to see how some of those things apply to fish culture. Use of analogies is an especially valuable tool, though it may be difficult at first for the trainee to recognize the usefulness of the analogies. This is an exercise in application of various problem-solving techniques as well as an introduction to technical concepts.
  - Encourage trainees, especially if they have some biology background and/or agricultural experience, to really delve into their memories and methodically think through concepts. Strengthening their own resourcefulness is another aspect of this component and ultimately builds a great deal of confidence;
  - Do not, on the other hand, attempt to push a trainee who really does not have the academic background or experience to arrive at a piece of knowledge. The objective is to build confidence, not reduce it. In a case where there is missing information that absolutely cannot be arrived at through creative thinking, brainstorming or logic, the best thing the trainer can do is to ensure that the trainee recognizes that there is a gap in this particular spot, help the trainee

formulate a clear question, and then encourage that trainee to fill in that piece of information at the first opportunity to do so. Reassure the trainee that there will be such an opportunity later;

  - The type of guidance given by the trainer will vary. Sometimes, the trainer will need to help the trainee find an angle of attack for a problem. For example, the trainer may help the trainee break down a vague problem into a set of more specific questions that can then be tackled one at a time. Occasionally, the trainee may need a nudge on a specific technical point. Often, especially with trainees who do not have science or agriculture backgrounds, the guidance the trainer must give relates more to helping the trainee overcome the fear of exploring new territory. In this case, a trainee may be embarrassed to express ideas or afraid to take the risk of acting on those ideas and may simply need encouragement and some reinforcement that his/her thought process is valid (this is not the same as verifying the correctness of the trainee's decisions or conclusions).
  - It is important to keep in mind is that brainstorming is a technique that many people have never really learned. If necessary, the trainer can point this out to the trainee and actually review the rules of brainstorming;
  - The plans should be written in a way that mainly addresses the "What", "When", and "How" of the activities described. The "Why" questions should be covered in the individual discussions between the trainer and trainee. The plans themselves should be detailed, organized plans of action. Tell the trainees it should be written in such a way that they should be able to give it to someone else to follow and that person should find all of the information needed to do exactly what the author intended;
  - It is not necessary for trainees to use the exact same language that the staff uses. This is important in that a discussion between a trainer and trainee can turn into a game of Password or Charades if the trainer insists that the trainee use exactly the term that the trainer would use. If the trainee describes the concept or activity clearly and the trainer knows that the trainee understands it, the trainer can either tell the trainee the technical term, or preferably, just use the trainee's term. The trainees will eventually get enough exposure to resources to learn the more common technical terms. Carrying capacity is a good example of a concept that trainees can often arrive at and describe, but for which they do not know the actual term. They often assign their own term, such as "maximum capacity" or "maximum crop" or some other descriptive term.

- The section of the management plan on fertilization is optional in the early stages of the development of plans. While almost any trainee, regardless of his/her academic background and experience, can probably reason that fish must be fed and that there are certain qualities of the water that may affect the fish, some trainees will not be able to reason, at this point, that fertilization might be an aspect of fish culture. By asking the trainee questions about what might be in the water, what fish might eat in nature, etc., the trainer might help the trainee to think about other organisms in the water, but this (or concepts like photosynthesis) can only be pushed so far with trainees who lack any background in biology. If the trainee doesn't consider it and the trainer feels it is more appropriate, fertilization can be left out of the initial outline. Once the trainee gains a little experience and begins to have access to other resources, fertilization can be added to the management plan;

- The timing and organization of going from writing the sections of the management plan to implementing them have been tried a number of ways. Trainees are not permitted to implement any section that has not been written in detail to the satisfaction of the trainer. (Note the word "approved" is not used, because any section is open to revisions, changes and additions once the trainee has tried it out and seen the results). Exactly which sections must be addressed to this extent before the trainee can begin physical work on the pond is the issue that has been approached in several ways. Unfortunately, once trainees stock their ponds and begin working, it is more difficult (mainly because of logistics) to ensure that they thoroughly cover all the required concepts in the other sections of their plans before implementing them. Ideally, it would be desirable to have all sections written before trainees ever leave the classroom. On the other hand, it is important to get the ponds stocked as soon as possible to give the trainees the longest possible growing time and the most possible experience working with their ponds and fish. Also, once the fish are in the ponds trainees feel a greater sense of urgency to get their feeding, fertilization, sampling and water quality monitoring sections done. Allowing trainees to begin pond preparation as soon as they have done that section of their plans is a good way to ease some of the tension they have been experiencing and breaks up the frustrating mental work with some physical activity. If this is done, it must be made clear to trainees that they are under some time pressure to work on their stocking sections as well. The trainer may be able to help the trainees structure their time by dividing the two tasks (pond preparation and stocking section of plan). Allowing trainees to stock their ponds before completing the other sections will probably be necessary due to the length of the training program, but staff need to put a lot of effort into their own organization in order to stay in very close touch with the progress of each trainee on the other sections of the plan. Building in certain procedures can help. For example, the appropriate trainer's initials can be required on a requisition for a Hach kit to ensure that the water quality section has been reviewed by the trainer before the trainee implements it. This is recommended, but difficulties do arise due to logistics and trainer to trainee ratios; and it can become very complicated and cumbersome. Having each trainer responsible for accounting for the progress of a specific set of trainees helps, but the difficulty of coordinating this should not be underestimated. Staff needs to commit to frequent staff meetings during this phase to closely monitor each trainee's progress;
- In the following sections, a list will be given of concepts and activities that should be addressed in the specified sections of the Management Plan. (Similar lists for other sections will be provided in Chapter Twelve.) These lists provide what is considered, in almost all cases, to be the minimum material that the trainee will need to consider and/or learn about for each section. However, this is another point where a reminder is in order to staff members regarding the importance of cautious judgement. Trainees possess different sets of skills and have a variety of backgrounds, and a certain amount of flexibility on the part of the staff is required:
    - **Pond Preparation:**
        - Consideration should be given to the condition of the pond bottom. A dry pond bottom allows for a "clean start", i.e., knowing exactly what fish are in the pond;

  - Consideration of condition of dikes (rebuilding or repairing them as necessary);
  - Planting or cutting of grass;
  - Setting drains.

- **General Pond Maintenance:**
  - Water management (maintaining desired levels, ability to drain and fill as needed);
  - Upkeep of physical aspects of pond (dikes, vegetation, drains and inlets, etc.);
  - Predator control;
  - Erosion control.

- **Stocking:** This is one of the more difficult parts of the Management Plan and involves some of the most basic, most critical concepts that will be covered in training. Use of analogies is a particularly helpful tool for understanding concepts like carrying capacity, yield, under or overstocking, etc. Trainers need to work very closely with trainees throughout this section, and pay close attention to how well the trainee understands the concepts. The actual decisions the trainee makes (in terms of numbers, for example) are less important than those concepts.

  The stocking plan can be divided into three major parts, if preferred. The first part is a description of the characteristics that would be desirable in a culture fish, the second section addresses the concepts involved in determining stocking rates and the actual numbers decided upon, and the third section describes the actual plan of action for physically stocking the fish.

  Part I. Desirable characteristics of an ideal culture fish species:
  - Hardy (i.e., disease resistance, ability to withstand handling and transport, wide range of tolerance in terms of water quality parameters);
  - Marketable;
  - Available;
  - Fast growth;
  - Feeds efficiently low on the food chain;
  - Omnivorous;
  - Reproduces easily enough to enable farmer to have own fingerlings for restocking;
  - Fecundity such that enough fry are produced for restocking without over-reproduction occurring (optional point for now).

  Part II. Determination of stocking rate:
  - Stocking densities (how many fish and total weight of fish to stock, what does it depend on, how is it determined, what affects the decision);
  - Carrying capacity:
    - what it is (amount of biomass of a particular organism that can be supported within a given area without gaining or losing weight);

    - how it is expressed (weight/area - not number of individuals, and not per volume);
    - what affects it (availability of food, oxygen, concentration of waste products, etc.);
    - how it can be manipulated (providing supplemental feed, fertilization, aeration, flow-through system, etc.);
- Effects of overstocking, understocking;
- Consideration of desired harvest size based on market demand and maximization of profit (Note: not necessarily "as big as the fish can get");
- How is carrying capacity used to help determine stocking density? (Carrying capacity divided by desired harvest size results in the number of individual fish to stock. The next step is to consider the size fish to be stocked, growth rates);
- Age and size considerations (Why is a small fish not necessarily a young fish and why is this an important point when stocking? How is growth affected by the age of the fish? During what stages of its life does a farmer have the most to gain by raising the fish?).

Once all of the important concepts and factors have been considered, the relationships between the factors have been discussed, the trainee has determined a carrying capacity for his/her pond (generally based upon an analogy), and a desired market size has been decided upon, the trainee has a few options, as follows, for making the actual decision about what to stock:

- One option:
    a) Divide the carrying capacity by the market size to determine the number of individuals;
    b) Calculate an assumed growth rate (generally based upon another analogy);
    c) Calculate how much growth is expected to occur over the length of time that the trainee will be raising the fish;
    d) Back-calculate to determine the weight the individual fish should be when stocked in order to reach the desired harvest size within the given time period.
- Another option:
    a) The trainee may determine that the most profit will be obtained (and/or the most knowledge if thinking in terms of the Trainee Goal) if he/she raises the fish when it is young, thus capitalizing on the fastest part of the growth curve. Thus, the trainee may choose to stock young fish, assigning a certain given size to those young fish at stocking;
    b) If, according to the growth rate anticipated, these fish cannot grow to the market size within the time constraints of the program, the trainee can determine the maximum amount of growth that is possible, thus deciding upon the size the fish would be at the training harvest time. He/she would then divide the carrying capacity by that figure in order to determine the number of fish to

stock in order to fulfill the maximum potential of the pond. Note: the trainee might use the following kinds of reasoning in this case: that the fish will be sold to another farmer who will in turn raise them to market size; that an extrapolation can be done, based on the information obtained through sampling and harvesting, to determine how much longer it would have taken to bring the fish to market size if he/she were to continue; and how close he/she would have come to achieving carrying capacity and market size simultaneously;

- There are other approaches the trainee could take, but the important thing is that each participant understands the factors, concepts and interrelationships. The trainer also may feel some frustration in allowing the trainee to proceed based on unrealistic expectations of carrying capacity or growth rate. It would help if the trainee did the feeding plan before making final stocking decisions because a more realistic growth rate can be determined when working through the feeding plan. However, the realities of dealing with a training program rather than an actual commercial fish farming situation come into play here. It is important to get the ponds stocked as soon as possible to maximize the time the trainees spend raising fish. Furthermore, trying to cover too much territory at once (in terms of concepts) could be very confusing and overwhelming. Trainers just need to remember that the trainees will learn from mistakes just as well as, and perhaps better than, they would if they did everything exactly correctly based on input from the staff. They will have plenty of opportunities to obtain more specific information as training progresses. Again, the concepts are more important than the numbers.

- The result of this section of the stocking plan should be a stocking request, which states the number of fish being requested, the weight of fish being requested, the expected harvest numbers and weights and the length of the growing period.

Part III. Plan of action for physically stocking the pond:

- How fish will be removed from where they are (if being obtained from another pond);
- How fish will be handled;
- What information will be taken, and how it will be taken (weights, lengths, numbers);
- How fish will be transported to the trainee's pond;
- How fish will be introduced into the trainee's pond;
- Equipment and materials needed.

Session II-2: Group Discussion - Profit Incentive in Fish Farming

Total time:* *35 minutes

Objectives:

- Put aquaculture in the context of farming and private enterprise
- Consider the meaning of profit, and how profit is an incentive in aquaculture;
- Encourage reflection on possible preconceived ideas of the Volunteer's role in the development of fish culture.

Overview: This session serves as a forum for a group discussion, primarily among the trainees, during which they can reflect upon an aspect of the job they will do overseas they may not yet have considered in depth. Some trainees may not actually think of aquaculture as a type of farming, or as a business. Often, trainees have preconceived notions about why fish culture is being promoted in the countries in which they will serve, how fish culture is perceived by host country farmers, and what the host country farmers hope to gain by raising fish. For some, the word "profit" has negative connotations. This discussion is not necessarily meant to result in any concrete conclusions, but is meant to provide food for thought and to help trainees see fish farming, and their roles as Peace Corps fisheries extensionists, in a more realistic light.

30 minutes

1. The trainer introduces the session by telling the trainees that they should spend this time thinking and talking about the idea of fish farming for profit. The trainer facilitates the session mainly by maintaining some order, if necessary, and by posing questions that may help trigger reflection and discussion. Suggested questions include:

- What do you think/feel when you hear the word "profit"?
- Why does this word sometimes elicit a negative response from many young Americans?
- What is profit? Define the term.
- Should farmers be trying to make a profit in a country where people are trying to feed themselves?
- Why might a person want to turn fish into money?
- What is a cash crop? What is a subsistence crop?
- What if a farmer only has cash crops? What if he only has subsistence crops?
- What happens to a country if farmers do not make a profit?
- What do you think happens to the fish culture business if farmers do not make a profit?

5 minutes

2. The trainer brings the meeting to a close by asking for a volunteer to summarize what has been discussed. Encourage the trainees to continue to think about this topic and to discuss it further among themselves.

Trainer Notes:

- It is hoped that the trainees will come away from this meeting with a stronger sense of the importance of profit as the main incentive for fish farmers. This will be especially provocative for those trainees who previously may have viewed the purpose of fish farming in developing countries as being strictly for subsistence and improved health, and who may have had the idea that people in developing countries are less interested in profit than are people from "developed" countries;
- In defining profit, it is hoped that trainees will conclude that profit does not have to be in the form of money (though, ultimately, money is important to farmers everywhere), but that no farmer is likely to continue farming a crop that does not produce a profit in some form.

Session II- 3: Stocking of Ponds

Time frame: Variable.
It is impossible to give a time frame for stocking ponds since this will take a different amount of time for each trainee. Some factors that affect the amount of time needed are where the fish are being obtained, whether trainees are working alone or in teams, whether each trainee will obtain all of his/her fish from one location, the distance the fish must be moved, and the amount of fish the trainee stocks. Although individual time frames cannot be predicted, the staff should set a specific date by which all ponds must be stocked.

Objectives:

- Get trainees' ponds stocked with fish;
- Obtain hands-on experience in harvesting, handling and moving fish;
- Learn through experience the importance of planning and organization when moving fish.

Overview: This is a field activity during which trainees stock their ponds based on decisions they made in the development of their management plans. For many, it will be their first experience actually working with harvesting equipment and handling fish. They will manage the ponds throughout the remainder of the training program.

1. The trainee submits a stocking request statement to a designated staff member after completing the stocking plan and being instructed to do so by the trainer with whom he/she has been working. The staff member informs the trainee of the location of the fish stocks, and tells the trainee whether or not to initiate stocking.

2. If the trainee will be working with other trainees during the stocking process, the trainer informs the trainee of this and instructs him/her to meet with the other team members to plan their work. The trainer states clearly that even if they are working in teams to remove the fish from their present location, each trainee is completely responsible for stocking his/her own pond and for collecting any data on the fish.

3. Trainees requisition the necessary equipment and commence stocking their ponds.

4. After stocking is completed, each trainee is required to turn in a statement describing exactly what they actually stocked, i.e., the number of fish, the individual weights and the total weight. Remind trainees to put their pond number and the stocking date on the statement as well.

Resources and Materials:

- Fish in sufficient numbers, sizes and ages of *O. niloticus* or *O. aureus* to stock all ponds and to provide some variety in what different trainees stock (other fish species can be included for diversity or as needed);
- Harvesting equipment as appropriate for the numbers of trainees, the ponds from which fish will be removed, the species, size and amount of fish to be moved. This includes: seine nets, dip nets, baskets, holding cages, tubs, buckets, etc.;

- Equipment for weighing and measuring fish, including scales (should have a variety of scales, some of which can be used to weigh larger fish in buckets of water, others which can weigh very small fish), measuring boards or rulers, tripods for hanging scales (or materials that can be used to make them);
- If trainees need to move the fish a fairly long distance, wheelbarrows may be helpful;
- If fish are to be transported from outside the training site, a vehicle, transport containers and possibly some form of aeration equipment may be appropriate.

Trainer Notes:

- Stocking can be very complicated logistically. One trainer should be designated coordinator, and all fish movement should be through this person. This coordinator must know, in advance, exactly what fish are where, and will need to keep careful records on inventories as they change during stocking;
- It is not always possible, or even desirable, to give trainees exactly what they request. If the size fish the trainee requested is not available, tell the trainee that he/she will have to make the necessary adjustments to the plan using the closest size fish that is available (for example, if the trainee requested 200 fish at 50 grams each, but will need to use 25 gram fish, the stocking number should be increased to 400 fish). If there are not sufficient numbers of fish, the trainee will again need to make adjustments in the plans and predictions based upon what is actually available for stocking.;
- For this first experience in stocking fish, it is preferable to have trainees work alone. However, due to either logistics considerations, time constraints or fish availability, it may be more practical to have trainees work in teams. If this is the case, be sure to give the trainees the instructions mentioned in step number 2, above. If there are not enough fish in the pond from which a team will be obtaining their fish to provide each team member with the amount requested, tell the team to divide the fish proportionately among them based on their requests;
- Since, for many, this will be the first experience harvesting, handling and moving fish, the staff should be prepared to see many mistakes being made. This is an important learning experience and except in very extreme circumstances, the staff should not interfere during the stocking process. Trainees will have an opportunity to reflect upon and critique their own actions shortly after this experience, and will have ample opportunities to apply what they learn and improve their techniques throughout the program.

Session II-4: Group Discussion - Fish Handling

Total time: 1 hour

Objectives:

- Share experiences from working with fish during stocking;
- Provide opportunity for trainees to compare, reflect on and critique their fish handling techniques;
- Emphasize the delicate nature of fish and the importance of proper, gentle handling to maximize health, growth and, ultimately, yield and profits;
- Establish some guidelines for handling fish.

Overview: This discussion provides an opportunity for trainees to process what they experienced during the stocking of their ponds and to clarify and discuss what they learned about handling fish. By sharing their experiences, comparing techniques and having a chance to think objectively about what occurred, they can draw some conclusions and put together a set of guidelines they can apply to future fish handling situations. As in other processing discussions, having the opportunity to discuss this among themselves also serves to relieve anxiety for some trainees.

5 minutes

1. The trainer introduces the meeting by informing the trainees that the topic of discussion will be fish handling. They are told that they will have a chance to share their experiences and compare ideas. The trainer points out that for many this was a first experience in working with fish, and encourages the trainees to think about what they did and to critique their efforts. They should think about what they did that they feel was good for the fish, as well as how they could improve their methods and techniques next time.

15 minutes

2. The trainer asks the trainee panel (selected and notified prior to the session - see Trainer Notes) to come to the front of the room. Panel members each take a few minutes to describe, in detail, exactly how they harvested, handled and moved their fish. The trainees should be encouraged to think about this "from the fish's point of view", and to address what effects they think their actions had on the fish.

25 minutes

3. Allow the panel members an opportunity to critique their own actions, then ask for input from the other trainees. Ask the rest of the group if anyone did anything very differently from the panel members that they would also like to share. At this point, the discussion should be open and mainly among the trainees themselves. Some questions that trainers can pose to stimulate the trainees' thoughts and conversation include:

- At what points in the process of handling and moving fish are the fish most vulnerable?
- In what ways can fish be injured or stressed?
- What are the relationships between good handling of the fish and efficiency for the farmer?
- What were some of the best things you did?

- What were some of the worst things you did?

During this discussion, the trainers can bring up things they observed during the stocking process that the trainees did not mention and ask the trainees for their reactions. (Caution: if trainers do bring up examples of poor handling, do not mention the names of the trainees involved).

5 minutes
4. The trainer asks the trainees to take five minutes and jot down some of the most important points they now know about handling fish properly.

10 minutes
5. The trainer asks the trainees to contribute their ideas to put together a good set of guidelines for proper fish handling. As the trainees volunteer their contributions, a trainer records their points on newsprint. The newsprint list is then posted in the classroom for the remainder of the day so that everyone has an opportunity to copy it.

Resources and Materials:
- Blackboard, chalk, eraser (trainees may want to illustrate a method they used on the board);
- Newsprint, markers, masking tape.

Trainer Notes:
- To avoid embarrassing trainees, or making them feel uncomfortable, select and notify panel members before the meeting. Choose trainees who, based upon observations by staff members, used a variety of techniques (both good and bad) when handling their fish. Also consider the trainees' personalities, sense of humor, and sense of perspective to be sure that they will be willing and able to relate their experiences openly, be open to criticism by the other trainees, and have the ability to laugh at themselves if appropriate, yet still understand and reflect the seriousness of the topic. Ask them if they are willing to be on the panel, rather than telling them that they have to be;
- The discussions should explore methods and techniques used during all phases in which fish were affected: seining, removing fish from the net, moving fish from one container to another, physically handling the fish with hands, weighing and measuring the fish, holding the fish while waiting to get more or while weighing them, moving the fish from one location to another, and introducing the fish into the new pond. All of these things should be examined from the point of view of the effects on the fish;
- One key point that should come out of the discussion that may not be immediately obvious is the importance of good planning and organization. Each person involved should know exactly what will be done at every step, and all equipment should be in good condition, prepared and in the best location to facilitate an efficient operation. The pond from which fish are being removed should be properly prepared (for example, one might choose to lower the water level); also, the pond into which the fish will be stocked should be prepared (sufficiently full of water, water quality and temperature

should have been tested, etc.). This will eliminate unnecessary steps or handling, minimize movement of fish and will allow for the fastest and most efficient operation;

- Some of the key points that should be included in the trainees' list of guidelines include (but not necessarily be limited to) the following:
    - Be well prepared. Have entire operation well planned and organized. (see note above);
    - Use the appropriate equipment for the fish being handled. For example, choose the proper size mesh net to avoid gilling fish, use the appropriate kind of net, (such as treated nets for catfish, softer nets for small, scaled fish, etc.);
    - Keep fish in water as much as possible;
    - Keep fish in fresh, clean water (not muddy water from pond being seined);
    - Handle fish as little as possible;
    - Minimize number of times fish must be moved from one container or net to another;
    - Wet hands before touching fish;
    - Minimize amount of time fish have to be held in buckets or tubs and monitor them closely;
    - Do not overcrowd fish in nets, tubs or buckets;
    - If holding fish in a net, keep the net suspended in water and be sure fish are not rolled or crowded in the net;
    - While holding fish in tubs or buckets, keep out of direct sunlight, covered and/or in shade to keep water cool;
    - When weighing fish, weigh them in water (weigh container with water first);
    - If measuring fish, keep board very wet and do it as quickly as possible;
    - Acclimate fish before putting them into a different pond;
    - Never dump or throw fish, tip container gently and allow them to swim out;
    - Move as quickly and efficiently as possible, but remain calm, do not panic, and make the fish the first priority;
    - As Dr. Clemens used to say, "Treat each fish as if it were the last of its species!"

Session II-5: Use of Tools and Pumps

Total Time: Integrated into other activities

Objectives:

- Make equipment available to trainees in an efficient manner;
- Familiarize trainees with available equipment;
- Provide experience in following set procedures and working within a bureaucratic system.

Overview: This is not a session, but is really a set of notes to trainers about the procedures that should be followed by trainees in order to obtain the use of equipment and pumps as needed to begin implementing the first few steps of their Management Plans. At this point, trainees do not yet have free access to the equipment. Responsibility for sheds and equipment is turned over to them in Week Three, and this transfer will be addressed in Chapter Twelve.

1. Once the trainee has developed a management plan to the point where the responsible trainer gives him/her permission to begin pond preparation, the trainer directs the trainee to the equipment shed to see the staff person who is in charge there.

2. At the shed, the trainer in charge instructs the trainee to enter the shed and make very thorough observations of all of the contents of the shed. As a result, each trainee will have his/her own inventory of the tools and equipment available in the shed.

3. When the trainee has completed the inventory, the trainer explains that a requisition must be submitted in order to borrow any of the equipment. The trainer explains the system for requisitioning equipment and shows the trainee a sample requisition that illustrates the required format. Requisitions must be neat and clean, and very clear, specific descriptions should be given of the equipment being requested. From this point on until the responsibility for the shed is turned over to the trainees, the trainee may not enter the shed again.

4. From the equipment shed, the trainer sends the trainee to see the trainer who is in charge of the pump (or whatever water supply system exists at the site). The trainer in charge of the pump gives the trainee a very detailed description and demonstration, addressing the proper use, care and maintenance of the pump. This includes all information that is necessary for using the pump and for keeping it in excellent repair when it is being used by many people. (For example, there should probably be a set procedure for checking oil level, grease points, belts and valves before turning on the pump. There may be requirements on how many valves must be open while the pump is running, etc.) Appropriate safety precautions should also be emphasized (not touching the switch or pump when wet, not touching moving belts, etc. as appropriate). For now, pump use also must be requisitioned, and information needed to use the pump should include whatever is appropriate, such as running time, number of gallons of water, etc.

Trainer Notes:

- There should already be certain staff members who have been designated as being in charge of the equipment sheds and pumps. These trainers should have done complete inventories prior to the time the trainees arrive. All equipment should be in excellent condition, and sheds should be clean, neat and organized when trainees see them in order to set an appropriate standard for when the trainees take over the responsibilities for sheds, equipment and pumps;
- During the period when trainees may requisition equipment but have not yet taken over responsibility for the sheds, there is a great demand on trainers' time for accepting requisitions and distributing equipment. Once most of the trainees have done their inventories, the duties for supervising the shed can be shared among staff members (or the trainer in charge of the shed should be relieved of other responsibilities in order to man the shed full time but this can be very tiring for the trainer). The trainer in charge must make certain that all staff members are well informed about the procedures that have been described to the trainees and consistency is imperative.

Session II-6: Trainee Evaluation of Training - Week Two

Total Time:* *Variable

Objectives:

- Provide feedback to the training staff from the trainees;
- Evaluate training activities;
- Provide an alternative channel of communication through which trainees can express concerns or opinions to the staff.

Overview: This is an example of how trainees may evaluate and express their reactions about the training program as they participate. Trainees are asked to evaluate the program at the ends of weeks two, four, six and ten. A sample of the evaluation form used in this program is given.

- The Master Trainer informs the trainees that a form is being distributed in order for them to evaluate the training program up to this point. It is pointed out that it is their choice whether or not to put their names on form. The Master Trainer can also point out that some people are more comfortable expressing themselves in writing, while others prefer to communicate verbally. Thus, anyone who has thoughts they would like to share with the staff verbally is encouraged to arrange for a special meeting. All input is welcome. Trainees do not need to feel limited by the format, and are welcome to add any points, comments or suggestions they may have. If, for some reason, a trainee would prefer not to fill out the form at all, request that it be returned blank so that all forms will be accounted for;
- The Master Trainer should be sure to allow enough time for the trainees to fill out the forms in a relaxed an thoughtful manner. If preferred, the staff may choose to let the trainees work on the forms overnight and turn them in the following day. This may be more comfortable for the trainees, but experience shows that if this option is taken, some of the trainees may not return the forms at all;
- Once completed evaluation forms have been turned in, the Project Director and/or Master Trainer should review them carefully. A summary of the trainees' comments should be shared with the entire training staff, and any special concerns, complaints, suggestions, etc. expressed by the trainees should be discussed with staff members as appropriate. (For example, if trainees comment on something that affects, or is a result of, the actions of the whole staff, it should be discussed with the whole staff. If one staff member has been singled out for some specific reason, it might be more appropriate to discuss it privately with that staff member);
- Issues that are raised by several trainees or that seem to be of concern to a large part of the group (as opposed to more isolated points) should be addressed with the trainees. Even if the response is to tell them that no change can be made or that a request cannot be met, the issues must at least be acknowledged. If there are common complaints about a particular issue or if suggestions are made that seem feasible and appropriate, the staff should make an effort to accommodate the trainees if these accommodations are consistent with the basic philosophies, methods and structure of the program;

- In responding to issues raised by trainees, the staff member who speaks with the group must be careful not to come across as defensive, resentful or angry. Staff should demonstrate the same openness to feedback that is expected of trainees.

- Following is a sample format that could be used:

  Name (optional) ______________________________
  1. On a scale from 1 to 5, rate the value of the following activities (0 = not at all valuable, 5 = extremely valuable), and give suggestions for improvement:
  First Day Orientation

  Posted Questions in Classroom

  Pond System Observations

  Personal Interviews

  End of Week Meeting, Week One ("Bridge to Peace Corps")

  Development of Management Plans

  Group Discussion about Profit Incentive in Fish Farming

  Stocking Ponds

  Group Discussion about Fish Handling

  2. How satisfied are you with your progress since your arrival at the training program? (very dissatisfied, dissatisfied, satisfied, very satisfied)

  3. If you are not "very satisfied" with your progress, what factors are related to your own performance?

  4. What factors are related to the training activities, resources, and/or staff?

  5. Please rate the following aspects of the program that are not related to technical training. (Unsatisfactory, Fair, Good, Very Good). Please make comments or give suggestions for improvement.
  Housing

  Meals

  Transportation

  Medical Care

  Addressing of Personal Needs (recreation, shopping, mail, etc.)

CHAPTER TWELVE

PROGRAM DESIGN - WEEK THREE

Session III-1: Quiz (Week Three)

Total time: 30 minutes

Objectives:

- Check and reinforce trainees' comprehension of technical material covered up to this point;
- Emphasize the importance of being observant and sensitive to those around you as aspects of good extension skills;
- Emphasize that trainees are accountable for material and are responsible for taking good notes.

Overview: This is the first of several quizzes that will be given throughout the program to check trainee comprehension and accountability. This quiz, like many in the program, is open book trainees may use their notes. This particular quiz combines some technical material with some non-technical issues that are important in the development of extension skills and cultural awareness. Quizzes can be developed by the staff to address any aspect of the material or skill development deemed important.

5 minutes

1. The trainer asks for quiet in the room and checks to be sure trainees are not seated so close together as to cause discomfort or interference during the quiz. Ask the trainees to spread out, if appropriate. The trainer tells the trainees that they may use their own notes to respond to the questions in the quiz they are about to be given and announces the time limit. Everyone is asked to get out a sheet of paper, and once the group has settled down, the quiz questions are posted on newsprint.

25 minutes

2. The trainees take the following quiz:
    - What are the full names of each of the training staff members, and where did they serve as Peace Corps Volunteers?
    - What are the full names of your roommates (or housemates), and what states are they from?
    - Name at least two of the people who serve or prepare your meals or provide services for you at your accommodations.
    - List at least five of the most important points in the proper handling of fish.
    - Farmer Joe has been raising catfish for eight years. He knows that the carrying capacity of his ponds is approximately 5000 pounds per acre. In order to harvest catfish with the popular market weight of one pound, starting with fingerlings that weight 0.1 pound, takes nine months. This year, the market price of catfish has gone up. Farmer Joe, afraid that this higher price will not last long, decides to try to harvest one pound fish in only six months. How can he do this? (Assume

he is already using the best feed available and in the greatest amounts possible). How many fingerlings does he need to stock his two-acre pond? What weight fingerlings should he stock? (Individual fish weight and total weight for the two-acre pond).

Resources and Materials:

- Prepared newsprint, tape or flip chart stand.

Trainer Notes:

- If all trainees have not yet completed their stocking plans, do not ask question five. In this case, a different question, perhaps one related to the Pond Observation exercise, could be substituted;
- For question number five, the most straightforward answers are: He can stock larger fingerlings, he will need to stock 10,000 in his two-acre pond, and he should stock 0.4 pound fish for a total stocking weight of 4000 pounds. This is based on an average growth rate of 0.1 pound per month. Since, in reality, growth does not occur at a constant rate, some trainees may try to find a way to account for a changing growth rate in making their calculations. Thus, grading of the quiz should not be rigid. Look for the reasoning the trainee has used, and for his/her general understanding of the concepts;
- The value of the quizzes used in training is not in terms of assigning numerical points to later be averaged together for a grade, nor are quizzes a form of punishment. Here, quizzes are meant to keep trainees alert and to provide them and the staff the opportunity to see how well they understand material and how well they can integrate and apply what they have learned. The staff should keep the quizzes on file, or at least keep a record of comments about how the trainees did on the quizzes. It is helpful to the trainees to go over the quizzes as a group so they can compare the approaches they used and their conclusions. Question number five, in particular, can initiate some interesting discussion since the answer to it is not absolute.

Session III-2: Management Plan (Part Two)

Note: Please see the section entitled Management Plan (Part One) in Chapter Eleven for the Objectives and Overview of this component and for several important Trainer Notes. This section will contain the major concepts and activities that should be addressed in the sections of the Management Plan that were not discussed in Chapter Eleven.

- **Feeding:** The Feeding Plan can be broken into three main parts, if preferred. The first part addresses the nutritional needs of the fish and the feed itself, i.e., what nutrients it must provide, the physical characteristics of the feed, etc. The second part addresses feeding amounts and projected schedules for feeding and growth. The third part addresses the actual methods that will be used for providing the fish with the feed.

  Part One: Nutritional needs, characteristics of the feed
  - The trainee should demonstrate an understanding of trophic levels (this may have been covered in the stocking plan);
  - Nutrient requirements of fish. The trainee should be able to list at least some of these, including, at minimum, proteins, carbohydrates and vitamins. The further the trainee can take this the better. The trainer should ask questions about what the different kinds of nutrients do for the fish, and should ask the trainee to try to make an educated estimate about the proportions of each major nutritional component required in the diet;
  - Description of the physical form of the feed. Some considerations include: size of the particle in relation to the size of the fish's mouth, sinking or floating characteristics, breakdown time in water, etc.

  Part Two: Feeding rate, projected growth, feed conversion
  - Determine feeding rate for the first day of feeding. This involves two major considerations: percent body weight the fish can be expected to eat, and the feed conversion ratio (FCR). The order in which these are examined will depend on the trainee;
  - In most cases, trainees begin by trying to determine a percent body weight that the fish will consume;
  - Once the an amount of feed is determined, the trainee can then try to project the feed conversion ratio in order to calculate how much growth will result from that much food;
  - Trainees should demonstrate an understanding of the shape of a normal growth curve, and should understand what a growth rate is. They should understand that growth slows as the animal ages, and that it is significantly reduced upon sexual maturity. They should realize that a very young animal normally requires a higher percentage of its own body weight in feed than a mature animal;
  - When the trainee has considered percent body weight as a way of estimating how much the fish will consume, as well as feed conversion ratio, he/she can make a chart with projected feeding rates, feed conversion and growth for the length of the growing period. This can be on either a daily or weekly basis (if the fish are small, the numbers involved will be so small as to be awkward to work with). Weights can

be for individual fish or for total weight of fish. The following is an example of the kind of chart referred to here (based on feeding 7 days per week):

	Total fish weight (lbs)	% Body Weight per day	Amount to feed/day (lbs)	FCR	Growth (lbs/day)
Week 1	100.0	5	5.0	2:1	2.5
Week 2	117.5	5	5.9	2:1	2.9
Week 3	137.8	5	6.9	2:1	3.4
Week 4	161.6	5	8.1	2:1	4.0

The chart would continue for the length of the growing time.

- Once the trainee has made the appropriate projections, he/she should discuss how adjustments will be made, and acknowledge that although the chart provides a projection, the real results will be observed over time. A similar chart, but with the number spaces blank, should be drawn up to be filled in over the course of raising the fish;
- Adjustments to feeding. This should be based upon fish's feeding response (actual consumption of feed) and information obtained through sampling;
- The trainee should develop a record keeping system for feeding.

Part Three: Actual method of feeding
- How feed will be put into pond;
- Location of feed in pond;
- Time(s) of day fish will be fed.

Notes:
- Since sampling is an important part of adjusting feeding rates, some trainees may choose to do their sampling section as part of the feeding section. This is fine and should not be discouraged as long as all aspects listed in the sampling section are addressed;
- Analogies are very helpful for thinking about feed as a percent of body weight and feed conversion ratios.

- **Fertilization:** For some trainees, especially those with no experience at all in fertilizing plants, gardens and lawns, and/or with no biology background, this will be a very difficult section. Some may not even consider fertilization at this stage and may need to add it to their Management Plans a little bit later, after some exposure to outside resources. For most, however, there are at least some basics that can be addressed:
  - Why fertilize at all? (Provide nutrients for phytoplankton);
  - Algae/plankton. What are they? What kinds of plankton are there? Are there any present in the pond? What role do they play as food for the fish? What effect do they have on oxygen in the pond?

- What nutrients must be provided through fertilization (nitrogen, phosphorous, potassium, others)? Which are limiting, if any?
- What are different types and forms of fertilizer that can be used?
- How much fertilizer should be applied? (This is very difficult for trainees with no experience. Analogies are helpful, but are only relevant if trainee has some analogous experience. Trainers should be flexible here, but do require the trainee to justify his/her decision. Often the trainee will simply elect to start with some very small amount to be safe, then plan to increase the amount in small increments until results are noted);
- Method of application (describe in detail);
- Effects of fertilization. What does the trainee expect they might be? How will they be monitored?
- Trainee should try to remember as much as possible about photosynthesis and respiration;
- Trainee should try to reason out what the dissolved oxygen cycles could be expected to be like in a pond;
- Monitoring plankton populations (turbidity, color, use of light penetration measurements, other observations);
- What happens if there is too much or too little plankton?
- Monitoring oxygen;
- Over-fertilization. What would be the results of over-fertilizing? How would they know? What would they do about it?

- **Sampling:**
  - Methods to be used;
  - Schedule (how often, time of day);
  - Relationship to feeding schedule;
  - How sampling results will be used to make management decisions;
  - Data to be collected, observations to be made: general health, growth, reproduction, etc.

- **Water quality:**
  - The number of water quality parameters the trainee considers monitoring will depend on the trainee's knowledge and background. With access to the test kits, he/she can consider parameters which were initially omitted;
  - Water quality parameters that will affect the fish: dissolved oxygen, pH, carbon dioxide, alkalinity, hardness, ammonia, etc.;
  - Schedules for monitoring water quality (frequency, time of day);
  - Methods (techniques, location in pond, depth, etc.).

- **Harvesting:**
  - Methods to be used;
  - Projected timing;
  - Calculation of yield and production.

- **Marketing:**
  - Gathering information about the market and marketing options;
  - Determining prices.

- **Accounting/Budget:**
  - Materials and equipment;
  - Running account of all costs and income.

Note: The sections on harvesting and marketing do not need to be developed in too much detail during the initial development of the Management Plan.

Session III-3: Equipment Shed, Feed Shed and Pump - Trainee Responsibilities

Total Time:* *Not applicable

Objectives:

- Increase trainee opportunities for independent decision-making and the development of management skills;
- Improve trainees' organizational skills, familiarity with equipment and time management;
- Improve efficiency of field activities by giving trainees free access to equipment, pumps and resources;
- Transfer responsibility for care and coordination of equipment to trainees.

Overview: This is not a session, but is a description of how responsibility for the care and maintenance of equipment, coordination of the use of equipment, upkeep and organization of the sheds and maintenance of resource inventory is transferred to the trainees.

1. Control of the equipment shed and pump is turned over to trainees after all trainees have taken an inventory of the equipment shed and received instruction in the care and use of the pump.

2. Once each trainee's feeding plan is accepted by the relevant trainer, he/she is to take an inventory of the shed that contains the feeds and fertilizers, similarly to the way this was done with the equipment shed. The trainees requisition feed and fertilizer as they do equipment until the point where everyone has begun feeding.

3. Each shed is assigned a trainee manager (or managers) who will be responsible for developing guidelines for the use of equipment, organizing and maintaining inventories, replacing, cleaning and repairing equipment. If the group is large, managers can be assigned to very specific sets of items (for example, a net manager, a tool manager and a water test kit manager).

4. Shed managers devise a system for the group to share the responsibility of equipment maintenance. Although they have ultimate responsibility, they are encouraged to involve everyone. Usually, a rotating system is designed giving each trainee a certain number of days on duty.

5. Some of the specific duties of the managers include:
   - Devising and monitoring a fair, organized system for checking-out equipment, in which any item can be tracked down at any time, and someone is always accountable for any item that is not in the shed;
   - Assuring that all equipment (including nets) is well cared for and returned clean after each use, repairs that trainees can do themselves are done, and the trainer in charge of inventory is notified of any needed repair work or replacements;
   - Assuring that sheds are kept clean, neat and orderly;

- Tracking the use of consumable items (feeds, fertilizers, grass seed, etc.) and notifying the trainer in charge of inventory well enough in advance to replenish all items as needed before anything runs out;
- Obtaining replacement reagents for water quality test kits from the trainer, as needed, as well as replacement parts for the test kits, if necessary;
- Submit a short weekly report to the trainer in charge of inventory concerning the condition of the sheds, equipment and inventory;
- Submit a final inventory to the trainer at the end of the program.

6. As training proceeds, trainees are so busy that they sometimes get sloppy about the equipment and sheds. Managers may call special meetings with trainees or impose certain restrictions as they see fit if it becomes necessary, but should clear all actions through a trainer before implementing them.

7. When the sheds are turned over to the trainees, the staff provides a list of cost and rent prices for all tools, equipment, feeds, fertilizers, etc. that are available in the sheds. Trainees may request price information on any items they use or obtain later that are not on this list.

Session III-4: Weekly Technical Report Requirements

Total time: 1 hour (30 minutes each for Parts A and B)

Objectives:

- Provide a means for trainees to evaluate and interpret what they are learning from their ponds to assist them in making management decisions;
- Provide practice writing professional technical reports;
- Provide means for evaluation of trainees' comprehension, ability to apply learned material and ability to interpret information they get from pond work;
- Provide documentation of trainees' pond activities.

Overview: Once their ponds have been stocked and they have begun management of their ponds, trainees are required to submit weekly reports that inform the staff of the activities being carried out at their ponds, observations they have made, data they have collected, and their interpretations of that data. This set of meetings provides trainees with information about what is expected and required in the weekly reports, and establishes a format that will be used throughout the program for all weekly reports (except the final report).

Note: Please note that this is a two part session, and is actually two separate sessions in that the parts take place on different days.

Part A:
10 minutes
1. This meeting takes place after all ponds have been stocked. The trainer announces that trainees will be required to submit a technical pond report each Monday morning which will provide the training staff with a summary of their pond activities for the previous week. The trainer makes the following points clear:

- The report should be a formal presentation of all activities, important observations, data collected and interpretation of that data;
- The report exclusively concerns their own ponds, it is not a report of all training activities;
- These are to be formal, professional reports, being written for and submitted to the training staff (not for a theoretical or imaginary audience);
- Reports should be clear, concise but complete, well organized, informative, and neat. In short, the reports should be of professional quality. Professional presentation includes such considerations as writing in pen (pencil only used for graphs, charts or diagrams), correct spelling, minimal erasures (either complete erasure or use White-out), pages numbered, etc.

15 minutes
2. The trainer asks the trainees to contribute some ideas about what information should be covered in the first pond report, and records these on the blackboard as they are called out. Trainees' responses should include, at minimum: pond number, pond location, pond description (including dimensions and volume), pond condition upon being assigned to the trainee, pond preparation activities, volume of water added, date stocked, species stocked (if known at this point), number of fish stocked, individual and total weights of fish stocked,

equipment used, accounting or bookkeeping information, and other activities or information collected up to this point. For example, any information related to water quality, feeding or fertilization that the trainee has done. (These latter topics will definitely be relevant in future pond reports, but not all trainees will have begun these activities in time for the first report).

5 minutes
3. At this time, the trainer does not designate a specific format. If trainees ask, he/she tells them that the format will be set after the first report has been done. This will give them a chance to get a feel for what kind of information goes into the report and to experiment with their own ideas for a format. After the first report has been submitted, a standard format will be established based on some of their ideas.

Part B:
20 minutes
1. The trainee who was selected (see Trainer Notes) to design the standard report format presents the format to the group. He/she may request input from the group, but discussion should be limited, and this trainee will take the leadership role in making final decisions. (There is usually some arguing, so some control must be exercised in order to settle this matter in a reasonable amount of time). The trainee invites questions to ensure that everyone is clear on the format that has been decided upon.

10 minutes
2. After the trainee has finished, the trainer checks again with the group to make sure everyone is clear on what has been covered. He/she acknowledges that there are many options for a suitable format. The one the trainee has presented was accepted as being appropriate for this situation and for the intended audience (the staff). The trainer reminds the group about the importance of professional presentation, completeness, clarity and conciseness, and organization. The trainer then informs the trainees of the following guidelines and procedures:

- Reports are due each Monday morning upon arrival at the training site. A box marked "Reports and Assignments" will be placed in the classroom or other designated common area, and trainees are to place the reports in that box. The trainer will collect them from the box;
- Trainees will be informed of which trainer reads and evaluates their reports (each trainer is assigned certain trainees' reports and works with those same trainees' reports throughout the program);
- The reports will become the property of the training staff, to be kept on file in the office. However, trainees will have an opportunity to look at their reports after they have been read in order to see the remarks made by the trainer. Thus, each Thursday afternoon, the reports will be returned on loan. Those reports are to be turned back in with the following report the next Monday morning to be put in the staff files. If the report is not acceptable (due to not meeting any of the established criteria), it will be noted in the trainer's remarks. In this case, the trainee will be required to redo that report (or specified sections, as noted by the trainer). The redo will be due the following Monday along with the original report and the next weekly report. All reports will be returned to the trainees at the end of the program.

Resources and Materials:

- Blackboard, chalk, eraser;
- Newsprint, markers and tape for the use of the trainee facilitator (to make visual aids for presentation of the format);
- Cardboard or wooden box, or other suitable container, for trainees to put their reports in.

Trainer Notes:

- The trainer who is in charge of reports (based on assigned supplemental duties) facilitates these meetings. He/she makes all final decisions regarding reports (in conjunction with the master trainer) - this applies to both trainees and staff. He/she will inform the staff of the criteria and of the format that was decided upon by the trainees, as well as any other information that will help insure consistency and good organization on the part of the staff;
- This trainer goes through all of the first week's reports and selects a trainee whose report was well written, in the format that the trainer feels will work best for a standard. He/she notifies the trainee, and asks him/her to prepare a presentation of the report format to give to the group. The trainer can discuss particular minor changes, additions or other points that will help fine-tune the trainee's format to make it completely acceptable to the trainer;
- The report should at least include the following, with specific format and organization to be decided upon by the trainees:
    - **Title Page:** title, name, dates covered, date submitted, pond number;
    - **Table of Contents:** with page numbers;
    - **Introduction:** pond number, purpose of report and of project, stocking data and information;
    - **Relevant sections addressing various categories of management, including:**
      Pond Preparation
      Stocking
      Feeding
      Fertilization
      Water Quality
      Pond Maintenance
      Sampling and Growth;
    - **Methods:** can be included within each section;
    - **Materials:** can be included within each section if appropriate, but must be listed in Accounting section as part of costs;
    - **Data:** both raw data and data that has been synthesized into a form to facilitate interpretation (graphs, charts, etc.). Trainees (or trainer in charge) can specify whether data is to be reported within the relevant sections or as appendices;
    - **Results and Interpretation:** can be subsections within each section, or can be a main section with the above management categories as subsections;
    - **Optional Sections:** additional categories to be included as appropriate, such as reproduction, disease, mortality, fish behavior that does not fit in elsewhere, partial harvests, etc.;

  - **Accounting:** itemized list of equipment used, all costs and expenditures, all income. Should include a running total of expenditures to date;
  - **Conclusions/Discussion:** general comments, problems, goals or plans for following week.

- After the first weekly report, once the standard format has been set, the trainer in charge should inform the other staff members of exactly what format has been established. He/she should divide trainees among trainers so that each trainer always works with the reports of the same trainees. This improves consistency and allows for trainers to track progress and improvements. All reports should, however, pass through the hands of the trainer in charge when turned in (in order to account for all reports turned in) and for distribution back to the trainees. The trainer in charge should check through the trainers' comments to be sure all staff members are being consistent in the type of feedback they are providing and in their own interpretation of the standards and criteria that have been set;
- If the staff feels it would be helpful, the trainer in charge of reports can develop a checklist to help trainers review the reports. This checklist should be as detailed as possible.

Session III-5: Field Trips - Week Three

Total Time:* *Not applicable

Objectives:

- Provide trainees with access to resources and technical information;
- Practice information gathering, filtering and assimilation;
- Practice interviewing skills;
- Develop increased self-awareness in professional role;
- Provide opportunity to observe aquaculture in practice, increase enthusiasm, and begin identifying with people in the profession.

Overview: This is not a session design, but is a set of trainer notes related to the field trip(s) that should be scheduled at approximately this point in the program (Week Three). By this time, trainees have explored several important concepts during the development of their management plans, and have gotten enough exposure and experience to have formulated many specific questions. They are at a point where they need more information and are now in a position to take advantage of an opportunity to obtain information and apply it to their pond work.

- The first trip should be scheduled once all ponds are stocked and trainees have begun implementing their feeding plans;
- Since not all trainees will reach this point at exactly the same time, scheduling trips can be complicated. If the option is available, trainees who are ahead of the majority of the group can be sent on working field trips where they actually spend a day or a half-day working with a local farmer, researcher or other aquaculture professional. If this can be arranged, have the trainees give a brief presentation the following day about what they did and learned for the rest of the group;
- The trip(s) can be to any aquaculture facility. Examples of facilities visited during previous programs include research facilities, commercial farms, state and federal hatcheries. The facility should provide access to resource people who are familiar with the basic concepts of fish farming and who have the time and patience to spend quality time with the trainees, fielding questions, explaining their operations in detail, etc. (In other words, it is not sufficient to send trainees to a facility where they will only be able to meet with a tour guide who serves strictly as a public relations employee but is unfamiliar with the technical aspects of the operation);
- The Master Trainer or the trainee in charge of logistics should make arrangements directly with the contact person with whom the group will meet. Be sure to get the proper spelling of his/her name, his/her title, and exactly how and where he/she can be reached prior to the trip and upon arrival. Get very clear, thorough instructions and be sure to repeat them back to verify them. Explain a bit about the program and about the group so the person will have some idea what to expect and will understand his/her role;
- A day or two before the trip, call the contact person again to verify the data and time of the visit;
- Be sure that any necessary arrangements regarding changes in meal schedules are made. If the trip will take all day and lunch will be eaten at the facility, arrange to have sack

lunches and bring the extra sack lunch(es) for the resource person(s). (Invite the resource person(s) to join the group for lunch when you call to verify the date);

- A day or two before the trip, give trainees a homework assignment in which they are required to list all the questions they have about fish and fish culture (If preferred, specify a certain number of questions, 15-20 perhaps. If the facility they will visit is an especially good place to learn about a specific aspect of fish culture, require that at least a certain number of the questions be about that topic);
- The day before the trip, inform two trainees that they have been selected to be the trainee facilitators for the trip. (Staff should choose two trainees who they think have the poise, personality and other skills that maximize the possibility that they will do a good job and set a good example for future trainee facilitators). Give them a brief overview of the trip - logistics, name of facility and contact person(s), main function of the facility and other information that may be important for them to know in advance;
- Once the trainee facilitators have been notified, hold a brief meeting with the group and have them brainstorm some ideas for the role of the trainee facilitators. The list should include:
    - Meet, greet and get the credentials of the resource person(s), and learn a little bit about the goals of the facility. Find out if the person has any special requests regarding the logistics during the visit, or if there are any special rules or restrictions he/she would like the trainees to be aware of. Relate these to the group;
    - Tell the resource person(s) about the program and the group;
    - Introduce the resource person(s) to the group and vice versa;
    - Watch the time and keep the group on schedule;
    - Maintain order and organization within the group throughout the visit;
    - Give the resource person(s) a lunch (if applicable), and be sure trainees join him/her during lunch;
    - Formally thank the resource person(s) at the completion of the visit;
    - Get all important information such as names, addresses, phone numbers, etc.;
    - Write thank-you note on behalf of the group upon return from the trip.

Session III-6: Processing of Field Trip

Total time: 1 hour, 25 minutes

Objectives:

- Share experiences and learnings from field trip;
- Compare ideas about utilization of resources, information gathering, filtering and assimilation and assess own effectiveness on the trip;
- Self-assessment of the performance of the group in terms of professional comportment.

Overview: Upon return from the field trip, a session is held to process the experience. In this session trainees have an opportunity to share and discuss some of the technical information they received. Another important aspect of the meeting is the examination of the experience from the standpoint of utilization of resources, gathering and assimilation of new information which are areas that trainees may not have consciously considered before. By focusing on this aspect, they can make some interesting discoveries and exchange ideas that they will be able to apply in future situations. During this session, trainees are also encouraged to give some thought to their own comportment and actions during the trip in order to increase self-awareness, as well as help trainees who are not accustomed to thinking of themselves in a professional role become more sensitive to what this entails.

10 minutes

1. The trainer asks each trainee to take out a sheet of paper and write down what they feel would be five appropriate questions to ask on a quiz concerning the trip the took.

15 minutes

2. The trainer asks the trainees to exchange papers, and take 15 minutes to respond to the questions posed on the paper they receive.

20 minutes

3. The trainer collects the papers, then asks the trainees to give him/her an overview of what they saw/heard/learned on the trip. A group discussion should be facilitated which includes a brief description of the facility and personnel, the goals of the facility, and what is done to meet those goals. It should also include comments by the trainees about points they found especially interesting, and information they learned that they plan to apply directly to their own pond management. As part of the facilitation of this discussion, the trainer can refer to some of the quiz questions that the trainees have turned in to stimulate conversation or raise interesting technical points. (Note: This discussion should address technical material and insights into the aquaculture industry.)

15 minutes

4. The trainer asks the trainees to now give some thought to the trip from the standpoint of utilizing resources, collecting information, and filtering and assimilating that information.

5 minutes
5. The trainer asks the trainees to take five minutes and write in their notebooks a list of guidelines or points they want to remember about information gathering, filtering and assimilation to be applied when given the next opportunity.

10 minutes
6. The trainer asks the trainees to imagine that they are in the place of the resource person(s) with whom they met. What kind of day did he/she have? What impression did he/she have of the group, and by extension, of the Peace Corps? Allow a group discussion that includes some self-critique by the group regarding their own performance, manners, sensitivity, consideration, comportment, demonstrated respect, etc. In concluding the discussion, ask the group to summarize any special points they want to remember for next time in order to present themselves in the best light and promote a positive, professional image and write these on the board.

10 minutes
7. The trainer asks the two trainee facilitators to comment on the role they played. What did they do? In what ways to they feel they helped the group and the resource person(s)? What do they feel they could have done better? Are there any tasks they feel should be added to or deleted from the responsibilities of the trainee facilitators? Do they have any specific recommendations for future trainee facilitators? After the two facilitators have responded, open up the same questions to the rest of the group. Ask them what they found most and least helpful, and for any suggestions from their point of view for future trainee facilitators. (Remind them that they will all serve in this role at some point).

Resources and Materials:
- Blackboard, chalk, eraser.

Trainer Notes:
- An option to number 2 is to collect the questions and pose them to the group at random;
- Examples of the kinds of points that should come out of the discussion in step number 4 include:
    - The importance of how questions are asked, i.e., carefully phrasing in order to minimizes the danger of misinterpretation on the part of the resource person or on one's own part in receiving the response; avoiding yes/no questions in many situations; avoiding putting someone on the defensive; being sensitive to touchy areas that may be too private or may be in an area in which the speaker is not confident, etc.;
    - The importance of taking copious notes. Do not trust memory when receiving a lot of new information, even details that do not seem important now may become very important later or help place a piece of information into context.
    - Knowing the resource, i.e., his/her credentials, objectives, needs, priorities, etc.;

  - Everyone is a resource for something; everyone has something of value to offer; and resources for information you need are not always obvious and may not be easily identified; don't be quick to make judgements;
  - "Relevance", i.e., whether or not a piece of information is relevant to one's own situation is not always immediately obvious; something may become relevant later; may actually be relevant in an indirect way (the basic concept may be transferrable even if the specifics of the circumstances are different); or may be something of which one has not yet recognized the importance, etc.;
  - "It depends" is a common answer given to questions. There are few, if any, absolutes in fish culture. This response is not evasion on the part of the resource person, it is simply a fact. What works, is correct, or is best in one situation may not be the best solution in another situation;
- In step number 6, the trainer should be careful not to put the trainees on the defensive. Although it might be helpful to gently bring up points trainers may have noticed on the trip (areas with room for improvement, examples of less than ideal comportment by some trainees, etc.), every effort should be made to let the trainees take the lead in critiquing themselves. If they feel this discussion is just meant as a thinly veiled reprimand by the staff, they may become defensive and close themselves off to valuable interaction;
- If time becomes a constraint, step number 7 can be delayed until the next time a field trip is planned. In preparing the group for that trip, the role of the trainee facilitators can be discussed.

Session III-7: Masonry and Carpentry Projects

Total time:* *18 to 21 hours

Objectives:

- Provide practical experience with basic carpentry skills such as:
  - designing a structure
  - drawing plans
  - measuring and cutting wood
  - using nails, screws and other hardware;
- Provide practical experience with basic masonry skills such as:
  - planning and budgeting for a masonry project
  - designing a form for concrete
  - using rebar and other reinforcement
  - mixing and tamping cement
  - doing multiple pours
  - curing concrete
  - removing forms;
- Practice working in groups and coordinating on planning, logistics and labor;
- Develop leadership and management skills;
- Learn about effectiveness of various management styles.

Overview: In addition to knowledge about raising fish, trainees must have a variety of practical skills in order to be effective in addressing unique problems or situations, especially during the construction phases of the projects with which they will be involved. An understanding of basic carpentry and masonry will be helpful for making the equipment that farmers may need to build ponds or raise fish, and for constructing or improving facilities such as holding tanks, inlet and drainage structures or transport tanks. These projects also give trainees opportunities to learn from one another, and to learn about their own style s when working in groups and dealing with the inevitable differences of opinion and approaches that arise when several people work on the same task.

15 minutes

1. Group leaders (previously selected by staff - see Trainer Notes) are notified. The trainer who is supervising this project informs them of their assignments and clearly describes their responsibilities. As part of the description of the task, the trainer should show the group leaders the construction site, if appropriate, and describe any required specifications or limitations. The group leaders are also informed of which trainees are in each group (for wheelbarrow projects there will be four or five trainees per group plus one group leader, for a large project such as the construction of a holding tank, groups might be as large as fifteen or twenty with two or three group leaders). Group leaders are informed that they are responsible for the following:

- Initial design of the form, wheelbarrow and/or other relevant structures;
- Drawing plans of their design;
- Describing the task and the design to the other members of their group, getting input from the other members and revising the plans accordingly;

- Providing the trainer with a copy of the written plans, projected budget and a materials list by a specified date;
- Coordinating and organizing the group for the actual construction;
- Assigning tasks, setting schedules, calling meetings if necessary, etc.;
- Ensuring that everyone in the group has the opportunity to get experience with all important skills, and keeping the group informed of the progress;
- Keeping the trainers informed of the progress of the project and requesting additional materials as needed;
- Facilitating a discussion at the completion of the project to process the exercise and evaluate the design, construction and group organization.

15 hours
2. Trainees work on construction of masonry form and/or wheelbarrows. If doing a form, construction time includes setting up of form, bracing and reinforcement.

1 to 3 hours
3. Trainees mix, pour and tamp concrete.

30 minutes
4. After allowing time for the concrete to cure, trainees remove form and shade or cover concrete as necessary for continued curing.

2 hours
5. Group leaders facilitate a meeting to process and evaluate their work. Discussion should address the design of the form and/or wheelbarrow as viewed after completion of the project (problems may have been encountered in using the wheelbarrow, removing the forms from the concrete, or using the concrete structure that suggest improvements in design), the construction methods used, the process of mixing, pouring and tamping the concrete, costs, time, etc. In addition, trainees should discuss how they worked together as a group, i.e. quality of leadership provided, group organization, dealing with differences of opinion, division of labor, etc. After the trainees have finished their discussions and drawn some conclusions, the trainer can provide technical input, share some of his/her own relevant experiences and share some observations regarding how the groups worked together.

Materials and Resources:

- Group leaders will need to have access to some information about masonry. This may be through reading materials, but human resources, either personal or telephone interviews with experts, are preferable. Some trainees may have carpentry and masonry experience, and they are encouraged to share their knowledge with their groups;
- Graph paper;
- Rulers;
- Newsprint, markers, poster board;
- Wheelbarrows and/or pick-up truck for moving heavy items;
- Lumber as requested by trainees;
- Nails, screws, bolts, other hardware as requested by trainees;

- Rebar and chicken wire for reinforcement;
- Wheels, old inner tubes for making tires, or other materials may be requested for wheelbarrows. Trainees or staff may choose to have trainees make wheels out of wood;
- Hammers, wood saws, hacksaws, screwdrivers, hand drills, drill bits, tape measures, line levels, carpenter's levels, wrenches, chisels, other hand tools as requested by trainees;
- Buckets;
- Water source, hose if appropriate;
- Shovels and hoes for mixing concrete;
- Brooms;
- Cement;
- Sand and gravel.

Note: The materials above are the most common requirements. Additional items may be required depending upon the actual project. (For example, if making a concrete elbow, PVC pipe will be required). Quantities also depend upon the number of groups and the actual projects.

Trainer Notes:

- One trainer should supervise this exercise. The trainees should be informed of this and should work directly with this trainer to avoid confusion and inefficiency. The trainer provides minimal technical guidance, but should be available to act as a sounding board as the group leaders work out their plans and strategies for organization. The trainer should interact only with the group leaders and should not get involved at all with the organization of the small groups. It is important that the trainer does not undermine the authority of the group leaders. The trainer should provide encouragement, logistical support, and supply all materials and equipment as requested. As the exercise proceeds, the trainer should stay in constant contact with group leaders, follow the progress of the projects closely, and make notes regarding suggestions and observations that can be shared at the end of the discussions held at the completion of the projects;
- The group leaders may be selected based on a variety of considerations. If the project is to be included as part of the group pond construction project. For example, if the trainees will be building a monk in the pond they construct, the staff may choose to have one member of the Site Selection/Pond Construction seminar team serve as a group leader. This should only be considered if there are three trainees on that seminar topic, however, because they will already have a great deal of responsibility for the construction project. A better alternative is to select a team of group leaders for the masonry and/or construction projects based on previous experience with the skills involved and the trainees' needs for leadership experience. Much attention should be given to this decision. Giving too much responsibility for a very complicated project to a trainee who is extremely shy or who is not well respected in the group can be counterproductive. If the project goes badly that trainee's confidence will be lowered rather than strengthened. On the other hand, this is an opportunity for trainees who lack this type of experience to develop new skills and confidence. The best approach is to select a team with a combination of skills and experiences that the staff feels will complement one another, especially if the project is a large one. The wheelbarrow

projects, which involve smaller groups and a more manageable task than something like a holding tank, are good opportunities for trainees with little leadership experience or confidence to learn about their own capabilities and develop their management styles;

- These skills may be practiced as a single exercise in which the form for the masonry project serves as the carpentry component. This is appropriate if the concrete structure that is to be built requires a fairly complicated form, such as a holding tank, monk or sluice. If the masonry project is to construct a simpler structure such as an anti-seep collar or concrete elbow, it is best to do a separate carpentry project. In the latter case, a wheelbarrow construction project is recommended because it provides not only the carpentry skill practice, but results in a very practical and appropriate product. The wheelbarrow they build can be field tested by the trainees during the program, and they can then improve upon the design and bring this with them to their countries;
- Each trainee must participate in both the carpentry and masonry components;
- The number of group leaders and trainees per group will vary according to the project and the number of trainees in the program. For a large masonry project such as a holding tank, as many as fifteen to twenty trainees per group with two to three group leaders is appropriate. In this case, it is especially critical to stress the importance of good organization, division of labor and scheduling to the group leaders. For a wheelbarrow project, groups should be limited to four to five trainees, with one leader per group;
- When informing the group leaders of their assignments, the trainer will have to determine when the initial plans are to be submitted. This will vary according to the training schedule and other work for which trainees are responsible. It is suggested that group leaders have a minimum of four days for working on the initial plans;
- There are a few options regarding step number 5, the group discussions. If there are several group projects, each group can meet separately first for about an hour. For the second hour, the larger group can get together to share highlights of the small group discussions and compare experiences, technical ideas and conclusions. If carpentry and masonry are completely separate projects, the processing should also be split up. If there are only two groups, one large meeting will be sufficient;
- In general, trainees enjoy this project and derive a great deal of satisfaction from it. Unlike much of their work with their ponds and fish, they can quickly see tangible progress and results, and they enjoy learning such practical skills. It is interesting to note, however, that in both the group discussions and the evaluation forms trainees complete every two weeks, they consistently cite the interpersonal interactions of the project as the more difficult aspects. They find working in a group (i.e., dealing with leadership or having to follow a leader, being organized, dealing with other personalities and opinions) very challenging and often frustrating, and they are often surprised by what they learn about themselves as they observe their own reactions and behavior;
- Trainers may find it helpful to refer to a booklet entitled "The Basics of Concrete" which was published by the U.S. Department of Housing and Urban Development.

Session III-8: Dissection Exercise

Total time:* *2 hours, 30 minutes

Objectives:

- Familiarize trainees with external and internal anatomy of the fish with which they are working;
- In the absence of other resources, learn to use observation of the fish's anatomy to learn about its habits and adaptations to its environment, and then use this information to help make management decisions;
- Provide experience killing a fish, allow trainees to observe their own reactions to this and begin to become desensitized.

Overview: This exercise takes place early in the program, before trainees have access to resources but after they have handled their fish and spent some time on pond management. For many, it will be the first time they actually look closely at the fish with which they have been working. Trainees will receive very specific information about fish anatomy later in the program, but since it is not uncommon to come across unidentified fish species in the field or to lack resource material, it is important to learn how close observation of that animal can provide a good deal of information. In addition, it is important for trainees to recognize that the fish they are raising will eventually be killed, and they must be able to kill fish when necessary. This provides an opportunity for them to observe their own reactions to this aspect of raising an animal for food.

20 minutes

1. In the classroom, trainees are given instructions for this exercise. They are told that each trainee is to catch a fish from his/her own ponds, kill that fish and dissect it.
They are to observe carefully, and record and diagram external and internal anatomy and all observations in extreme detail. It is important to point out that this is not a test of the trainees' knowledge of fish anatomy. Depending upon their backgrounds, some trainees may have previous experience and knowledge about anatomy and physiology while others may never have held a fish before coming to training and have little science background. It is an exercise in observation and deductive reasoning. The notes they take will become a notebook section. They are to be handed in the following day, but will be returned to the trainees within a few days to be put into their notebooks.

Have trainees take out a sheet of paper and spend 15 minutes writing down questions they would like to try to answer through this dissection, or specific things they want to look for. Encourage them to also list the steps they will go through to carry out the dissection. (Remind them that since they will be dissecting the fish, the method they use to kill it should not cause physical damage that would make it difficult to identify internal or external organs and/or to observe them as they actually look in a normal fish). When they have finished this and feel prepared, they should go out to their ponds to catch their fish.

2 hours

2. Each trainee catches a fish from his/her pond, kills it and dissects it, recording all observations and any conclusions that can be drawn. Staff should observe, but should not

provide input except in the case where a trainee needs to talk through his/her reservations about killing the fish and receive moral support.

Materials/Resources

- Since this is a field exercise, not a laboratory dissection, dissecting kits are not provided. Trainees should be told the day before this exercise to be sure to bring their pocket knives;
- Scraps of plywood, styrofoam, cardboard or some other material to be used as work surfaces for the dissections;
- Colored pencils;
- Magnifying glass not necessary, but might be helpful for trainees who request it;
- Seines and/or cast nets for catching fish (trainees should already have access to these in their equipment shed).

Trainer Notes:

- Trainees who stocked small fry may ask to use different fish since theirs are too small to dissect and observe easily, especially the internal anatomy. Since they will eventually do a more in-depth dissection with much more information during seminar week, we feel it is valuable for them to actually work with their own fish in this exercise. This reinforces the importance of a farmer being thoroughly familiar with the animals he/she is raising. By making very detailed observations of their own fish, the trainees will be able to make management decisions based on their knowledge of their fish, and will be able to note subtle changes that may occur over the course of their pond work. A good compromise is to require the trainee to do his/her best with his/her own fish, but allow him/her to also dissect a fish from another trainee's pond that is the same species, but larger;
- Trainers must be sensitive to the fact that killing and dissecting a fish will be difficult for some people. It is important to let those people talk out their feelings and to provide whatever support and encouragement is appropriate for helping them through this. Similarly, it is imperative that trainers also remember that observation and drawing of logical conclusions based on observations are the main points of this exercise, not knowledge and understanding of fish anatomy and physiology.

Session III-9: Social Awareness

Total time: 1 hour, 5 minutes

Objectives:

- Provide opportunity for trainees to reflect upon their awareness of their environment and observation skills in a social sense;
- Provide opportunity for trainees to reflect on their perceptions of the cultural and social mores of the area;
- Provide opportunity for trainees to reflect on their own behavior, appearance and general self-presentation in the context of their environment;
- Develop increased sensitivity and respect for customs, values and accepted standards of appearance and behavior in the local area.

Overview: This is a session in which time is allotted for giving thought to issues that sometimes get overlooked by trainees. Some of the non technical, but very important, personal characteristics that are so important in being an effective Peace Corps Volunteer can be all but forgotten due to the hectic pace of training, combined with what can become a sense of anonymity or feeling of being invisible due to bèing part of a large group. In this meeting, trainees are given an opportunity to concentrate on the cultural and social aspects of their surroundings, and are encouraged to examine their own actions, attitudes and manners in regard to those issues.

10 minutes

1. The trainer asks the trainees to take about ten minutes to jot down some responses to the following questions based on their own observations (trainee responses should be as specific as possible):

- What are the major industries in this area? How do most people here make a living? What is the economic base for this area?
- What appears to be the socioeconomic status of most people in this area, and what kind of a range seems to exist?
- What do people in this area enjoy doing for recreation and relaxation?
- What have you noticed about acceptable standards of dress, appearance and behavior for various situations (eating in restaurants, shopping, going to work or school, etc.);
- How do people here generally greet each other?
- What are the most common religions practiced in this area?
- What are some of the public or social issues about which people in this community seem most concerned (education, drugs, unemployment, environmental issues, etc.)?

15 minutes

2. The trainer asks the trainees to volunteer some of their responses to initiate a group discussion. Continue the discussion for about fifteen minutes, allowing trainees to share their observations and interpretations.

20 minutes

3. Tell the trainees that they will be breaking into small groups, and tell them how the groups will be divided (approximately four groups). Tell them that when they get into

their groups, they should address the following questions. Two groups should list their responses to the first question on newsprint. The other two groups should list their responses to the second question on newsprint. (All groups should discuss both questions among themselves). The questions are:

- Based upon their observations of and interactions with you, what impression do you think people in this area have of Peace Corps Volunteers, and what would you say is a likely range of assumptions they would make about Peace Corps Volunteers?
- Assuming you now have a somewhat enhanced awareness of the area and of your own actions, what can you do, as individuals and/or as a group, to be sensitive to the local area, integrate smoothly and promote a positive image of yourselves and of Peace Corps?

20 minutes

4. Each group presents its newsprint list. The group discusses each list, sharing and comparing their ideas.

Resources and Materials:

- Newsprint, markers, masking tape.

Trainer Notes:

- This session should be as early in the program as possible, yet far enough into the program for trainees to have had an opportunity to adjust to the program and to the local area;
- Suitable times for this session are either as part of an end of the week meeting on a Saturday afternoon, or as a Monday morning meeting;
- The staff should allow the trainees to take as much control as possible in this meeting. The majority of the conversation should be among the trainees. Staff should be cautious about putting trainees on the defensive by pointing out examples of insensitive or inappropriate behavior that the trainees have exhibited as that would probably result in a counterproductive session. However, if trainees have demonstrated seriously inappropriate actions or behaviors, or if they fail to assess themselves in a balanced way or go into sufficient detail, it may be necessary to bring these up for discussion in a tactful and non-threatening manner.

Session III-10: Personal Interview - Week Three

Total Time:* *Very variable. Average is between 20 and 30 minutes per trainee.

Objectives:

- Provide opportunity for trainees to give concentrated thought to self-assessment;
- Provide opportunity for trainees to discuss their feelings about being in the program (both short and long-term) and their level of commitment at this point;
- Provide opportunity for each trainee to receive feedback from the staff regarding his/her performance in the program;
- Reinforce strong points of each trainee's performance and discuss strategies for improving weaker areas;
- Provide an opportunity for each trainee to express any concerns or discuss any issues he/she may care to share with the staff.

Overview: This interview is quite different from the first one. Trainees prepare for it ahead of time by filling out a self-assessment form that is meant to help them evaluate their own strengths and weaknesses and target areas in which they are strongest or would like to improve. There is an exchange of perceptions between the staff and the trainee, and the trainee receives direct feedback from the staff.

1. At least one day prior to the first interview, the trainees are each given a copy of the attached self-assessment form. They are asked to consider the items listed on the form very carefully, and respond to each point thoughtfully and honestly. Tell them that they are not limited to the issues on the form, and that they are welcome to bring up any other matters they care to discuss at their interview.

2. Prior to the interviews, the staff also completes a form (the same form the trainees received) for each trainee. During this process, frequent reference should be made to the behavioral data files. Using the form as a vehicle, the staff will determine what they consider to be the most important points to discuss with the trainee, and will prepare themselves to provide objective, balanced feedback.

3. The interview should be held in a quiet, comfortable, private location. The Master Trainer and one other trainer should be present at each interview. When the trainee arrives, the trainers greet him/her, and the Master Trainer explains what will occur during the interview. It is explained that the interview will begin with the trainers asking the trainee a few questions. Following that, the trainee will be asked to share the ratings and comments he/she put on the self-assessment form, and the trainers will give the staff perspective on some of the issues on the form as well. Special attention will probably be given to points for which the trainee and the staff have indicated very different opinions, or to areas that either the trainee or the staff feel should be further examined.

4. Although staff note-taking during the interview should be kept to a minimum, the Master Trainer should explain to the trainee that the trainers will be writing down some of the ratings the trainee has given him/herself, and that the trainers might jot down a

few notes. This is to help them remember points that they want to discuss further at a later point in the interview.

5. The Master Trainer asks the trainer to begin the interview. The trainer asks the following questions (obviously, the trainees responses may require further discussion and necessitate a departure from this order or set of questions):

- Now that you have left your family, friends, school or job behind and you have been here at the training site for about three weeks, how do you feel about your decision to join Peace Corps?
- Do you feel that you have any loose ends or unfinished business that you haven't fully addressed yet?
- You have begun to get some hands-on experience in fish culture, is it similar to what you anticipated? In what ways is/isn't it?

6. The Master Trainer then asks the trainee:

- Earlier in the program, you listed some personal goals for training. How do you feel about those goals not, and have you been making progress toward achieving them?

7. The Master Trainer now asks the trainee to go through the self-assessment form. Discuss the trainee's comments about his/her own performance, and provide feedback on the staff's perceptions of the trainee's performance in the different areas. If appropriate, help the trainee to put his/her feelings into perspective (sometimes trainees are very hard on themselves), recognize his/her strengths, and develop strategies for making improvements in areas either the trainee or the staff consider weak.

8. After discussing the issues in the assessment form, the Master Trainer asks the trainee if there is anything else that he/she cares to talk about. (If the staff has other issues they want to address, these are brought up as well).

9. In concluding the interview, ask the trainee to summarize what he/she feels are his/her strongest areas, and what the individual has targeted as areas to work on. Ask the trainee if there is anything in particular about which he/she would like to receive feedback in the next interview. Remind the trainee that a special interview or specific feedback may be requested at anytime.

Resources and Materials:

- A comfortable, quiet, private location;
- Two copies of the self-assessment form per trainee (one to be given to the trainee, one to be filled out by the staff).

Trainer Notes:

- After the interview, the trainee keeps his/her form so that he/she may continue to refer to it. The staff keeps the copy that was completed by the staff;

- This approach to personal interviews was developed after a series of other approaches and modifications. At first, no self-assessment forms were used. Trainees were asked to evaluate themselves verbally at the interview. This resulted in the trainees often doing too little talking in their own interviews. They tended to remember every detail of negative feedback, yet seemed to retain almost no memory of the positive feedback they received. The first few times a self- assessment form was used, the results were encouraging, but the forms themselves were too general and vague. There were no ratings, just a space for comments, and many trainees did not actually fill them out, thus they did not take the time to really think about the issues listed. The form that is provided here was finally developed and has worked very well. By placing a greater emphasis on the process of self- assessment and providing an instrument that really demands it, the trainees seem to put much more effort and honest thought into evaluating their own performances, plus they seem more receptive to hearing the reactions of the staff to their own assessments. It creates a non-threatening, supportive atmosphere and a sense of trust and mutual respect that allows for a greater exchange of ideas and a much more open, positive attitude toward the process of giving and receiving feedback;
- In the case of a trainee who is having real difficulties in the program, or who may even be under consideration for administrative separation, there may need to be some subtle differences in the way the interview is handled. More staff members should be present, and the need for thorough documentation will probably require more note-taking during the interview. Review required procedures for administrative separations and/or resignations as outlined in Peace Corps Manual Section 284 to ensure that the trainee receives fair treatment and that all correct procedures are followed;
- Following each interview, the staff members who were present should make notes for the files about what occurred, about the trainee's self-assessment, the feedback that was given, and the feedback that the trainee requested be provided in the next interview;
- Following is a sample of a self-assessment form:

TRAINEE SELF-ASSESSMENT FORM

Name: ______________________________ Date: ______________

The following is a list of some skill indicators that fall under the Assessment Dimension categories outlined during orientation. Please rate your own performance in these areas up to this point in training. Make any comments you may have and note points that you would like to discuss during your personal interview. Use a rating scale of 1 to 5 where 1=Weak and 5=Strong.

	Rating	**Comments**
► Perseveres in difficult, ambiguous or frustrating situations and with difficult tasks or assignments.		
► Listens actively, pays attention and participates actively in group discussions/projects.		
► Completes written assignments on time and satisfactorily.		
► Is assertive in making use of available resources and records information appropriately for future use.		
► Takes some leadership roles, demonstrates leadership ability.		
► Is self-motivated, takes responsibility for learning and doing, and can work independently.		
► Sets goals and plans effectively.		
► Demonstrates technical competence. Understands and applies technical principles.		
► Able to identify and analyze problems. Is innovative and creative in solving problems, and can apply own skills and knowledge to new situations or problems.		

	Rating	**Comments**
▸ Exhibits enthusiasm and curiosity about problem-solving activities. Seeks out and accepts challenges.		
▸ Communicates effectively.		
▸ Is willing to give and receive feedback, and responds to feedback in a constructive manner.		
▸ Recognizes own strengths and limitations.		
▸ Adjusts rapidly to new environments. Demonstrates flexibility and a willingness to change behavior when appropriate.		
▸ Projects professionalism, self-respect and respect for others through behavior and personal appearance.		
▸ Observes common standards of etiquette.		
▸ Avoids stereotyping; is not judgmental. Demonstrates interest in others and a willingness to consider other ideas and opinions.		
▸ Demonstrates integrity in complying with training rules and the spirit of individual training.		
▸ Additional Comments:		

CHAPTER THIRTEEN

PROGRAM DESIGN - WEEK FOUR

Session IV-1: Introduction to Surveying

Total time: *5 hours*

Objectives:

- Familiarize trainees with use and care of surveying equipment;
- Instruct trainees in basic surveying techniques;
- Introduce surveying record keeping system.

Overview: This session will introduce the concepts,methods and equipment used in surveying, a skill that will be extremely important for site selection and pond design. Trainees must become comfortable and familiar enough with these concepts and instruments to be able to apply them to new situations. The session begins with classroom instruction which includes a discussion on the purpose and uses of surveying and an introduction to the equipment and techniques. Field practice is interspersed with classroom work to give trainees hands-on experience and help reinforce the information they receive.

10 minutes - classroom

1. Trainer leads discussion of the definition and importance of slope:
    - Ask people to compare object heights at various distances by eye;
    - Introduce dumpy level;
    - Brainstorm uses for dumpy level (building roads, building bridges, laying out water systems).

10 minutes - classroom

2. Trainer points out parts of a Dumpy Level:
    - Scope (will see horizontal and vertical cross-hairs);
    - Focus knob (200 foot accuracy);
    - Thumb knobs to adjust level;
    - Table and compass.

20 minutes - classroom

3. Trainer demonstrates how to set up tripod and level instrument:
    - Set tripod to comfortable height, attach dumpy level, level dumpy level.

During this demonstration, trainer also emphasizes the importance of proper care and handling of this equipment, i.e., avoiding over-tightening of screws, stabilizing tripod, proper replacement of level in case, working in rain, etc.

10 minutes - classroom

4. While instrument is set up, trainer shows how to use table and compass to determine angle between two points and does a simple example between two objects.

20 minutes - in classroom or outside

5. Trainer demonstrates use of the stadia rod for measuring differences in elevation:
    - Reading the measurements on the rod (may be calibrated in feet and tenths of feet,meters and centimeters, etc.);
    - Taking a reading off an object with a known height;
    - "Rocking" the stadia rod for accurate readings;
    - Using hand signals for communication.

20 minutes - in large classroom, hallway or outside

6. Trainees figure out their pace by walking off a measured distance (100 feet) several times while counting steps.

2 hours 15 minutes

7. Field Practice: If possible, work in groups of four or five trainees, each group having its own set of equipment. A trainer should be assigned to each group.
    - 30 minutes. Set up three different stations and have each trainee take readings from the same point (level is set up once and remains in place) and record their readings. Readings of each station should be identical among all the trainees, but some differences will probably occur. Use this to initiate discussion of what different readings mean, how errors in reading can be made and the effects of these errors. Also use the change in readings between stations to discuss and illustrate slope.
    - 45 minutes. Set up three permanent stations for each group. Have each trainee practice setting up the dumpy level and taking readings of the three stations. Discuss reasons for differences between people's readings. This will introduce the concept of height of instrument.
    - 1 hour. Set up flags at ten different stations which cannot all be seen from one point. Tell the trainees that the first station has an elevation of 100 feet. Tell the trainees that they must determine the elevation at each of the other stations, as well as the average slope between the first and last stations. Each small group does this.

35 minutes - classroom

8. Have the different groups compare how they did the last exercise. This will help introduce the concepts of bench mark, elevations based on a known, back-sighting and record keeping. Trainer now introduces the standard record keeping system that will be used throughout training. Have trainees practice this by putting either a set of sample data or some of their readings from the last exercise into a format like the following:

Station	Back Sight (FS)	Height of Instrument(HI)	Front Site (FS)	Elevation	Remarks
B.M.	1.5	-	-	100.0	
-	-	101.5	-	-	
1	-	-	5.3	96.2	
2	2.1	-	5.5	96.0	
-	-	98.1	-	-	
3	-	-	3.6	94.5	
4	1.8	-	4.1	94.0	
-	-	95.8	-	-	

Note: Elevation = HI - FS; HI = Elevation + BS.

10 minutes - classroom
9. Allow time for a question and answer period to discuss ideas that came up in small groups during field practice and to address any remaining points of confusion.

Resources and Materials:

- This session can be facilitated by a staff member or by a guest expert;
- The classroom should be set up so that everyone has a clear view of the demonstrations. Milk boxes, stools or other objects of different heights will be helpful for illustrating slope and elevation changes;
- Blackboard, chalk, eraser and/or newsprint, markers and flip chart stand;
- Prepared poster with blank record-keeping format sheet,to be filled in as part of instruction on this topic;
- Surveying equipment sets, each set to include: tripod,stadia rod, dumpy level, tape measure, several surveying flags.

Trainer Notes:

- Although one person will be the main facilitator, a trainer should work with each small group;
- Trainers should all be aware of exactly what is to be covered during each phase of this set of activities. Although there are alternative methods that can be used for certain aspects of surveying (for example, record-keeping format), all staff must be consistent and work with a standardized version that is agreed upon before the session;
- Some trainees may have prior experience with surveying or progress at a faster rate than others. Additional practice exercises can be given to these trainees. In fact, since this session takes up most of a day, the remainder of the day can be used for additional practice for all trainees. Some suggestions for other exercises include:
    - Running circuits: Have trainees run a series of readings around an obstacle necessitating movement of the instrument several times. When they re-read the first station after completing the circuit, the elevation should be the same as what they initially determined it to be. If this does not work out, they should assess possible causes for the error and repeat until they can be accurate;
    - Survey a line of ten or twenty stations at five or ten foot intervals with a slope of 1% between stations;
    - Survey across a broad dip in the land or a wide ditch. Imagine you have to build a four foot wide, level walkway across the dip, with several sets of supports along the bridge to hold it up. Determine the heights of each set of supports as they would need to be built;
- The day after the introduction to surveying takes place, a quiz can be given to check trainees understanding of and ability to apply the material. The following is a sample quiz:

QUIZ

Name:______________________

1. Three 2 sites lie on a straight line. The distance from Site 1 to Site 2 is 40 feet and from Site 1 to Site 3 is 85 feet. The surveying instrument was initially located at Station A from which Sites 1 and 2 could be seen. It was then moved to Station B from which Sites 2 and 3 could be seen. The following survey data was obtained:

Station A	**Station B**
Back sight of Site 1 = 3.8	Back sight of Site 2 = 4.5
Front sight of Site 2 = 1.9	Front sight of Site 3 = 2.3

Organize the above data in a standard format and calculate the following:

- The slope from Site 1 to Site 2;
- The slope from Site 2 to Site 3?

2. A bench mark (BM) with an elevation of 100 feet and 5 sites lie on a straight line. The distance between consecutive sites including the BM is 25 feet. In order to view each of these sites it was necessary to move the surveying instrument twice. The following survey data was obtained:

Station A	**Station B**	**Station C**
Back sight on BM = 3.0	Back sight on Site 2 = 3.1	Back sight on Site 4 = 6.1
Front sight on Site 1 = 3.2	Front sight on Site 3 = 1.7	Front sight on Site 5 = 6.8
Front sight on Site 2 = 2.4	Front sight on Site 4 = 5.7	

Organize the above data into a standard format and calculate the elevations of Sites 1 through 5. Also calculate the following:

- The slope between Sites 2 and 4;
- The slope between Sites 1 and 5;
- The slope between Sites 3 and 4;
- The slope between Sites 2 and 5.

Session IV-2: Surveying Projects

Total time: ***13 1/2 hours (assuming four groups)***

Objectives:

- Give trainees practice using surveying techniques;
- Apply surveying techniques to practical uses and basic pond design;
- Practice use of a hand level and hand-made stadia rod;
- Practice speaking before a group, presenting technical material in a formal setting and using visual aids;
- Develop report writing skills (ability to present technical material in an organized, meaningful and professional written form).

Overview: This is actually a set of projects to be completed by trainees either in pairs or small groups as specified. These projects provide practice in the use of surveying equipment and allow for a variety of applications of the principles. Since trainees should have a good grasp of the basic concepts, they are ready to use the hand level as a substitute for the dumpy level. They will do two exercises using the hand level, the first serving to help them improve their accuracy, the second to obtain meaningful information about their own ponds. In addition, they will work in small groups to complete a more complex project which they will later present to the large group. Written reports will be required for two of the projects.

1 hour
1. In pairs using hand levels, run a circuit, or series of readings, around a grove of trees or other obstacle so that all readings cannot be taken from the same spot. When the first station is re-read after completing the circuit, the elevation should be the same as what it was initially determined to be. If this does not work out, trainees should assess possible causes for the error and repeat until they can be accurate.If the final elevation is not equal to the initial elevation, discuss sources of error.

2 1/2 hours
2. With a partner, each trainee surveys hihe/sher own pond. While working on hihe/sher own pond, the trainee's partner serves only as a rod person.

7 hours
3. The following projects are to be done in small groups of four to five trainees. Trainees may choose which instrument they prefer to use for this project, the dumpy level or hand level. Each group is assigned one of the following projects:

A. Find an area with a slope. Starting at a high point, imagine that you will need to begin a trench that is five feet deep at that high point. The trench will continue to be dug at a 1% slope until it reaches a point where it meets natural ground. Stake out the trench at intervals no greater than ten feet (shorter intervals are fine and there is no maximum number of readings). Calculate the depth from the surface to the bottom of the trench at each station, and determine the amount of dirt that would need to be dug out in order to dig this trench. The trench will be one foot wide.

B. Survey an area 100 feet by 100 feet in size. Take readings every 10 feet for a total of 121 readings, moving the level at least two times. Use these readings to make a contour map of the area. (Stress that trainees are to choose an area that includes some irregularities such as hills and/or dips to make this project interesting and better demonstrate how to make and interpret a contour map).

C. Survey the entire pond system at the training site (or another nearby pond system, if more appropriate). Concentrate on the drainage and dike systems. (If water supply is gravity flow, include this as well).

D. Show trainees a water source and, at some reasonable distance, a group of real or imaginary ponds. Tell trainees that they are to determine the best layout and design for a gravity-flow water supply system (using pipes or canals) from the source to the ponds. Each pond should have its own inlet. They should know all critical elevation points.

45 minutes per group - Classroom

4. Two trainees from each group will be assigned to present their group's project to the large group in a classroom session (the selected trainees will be notified the afternoon before the presentations take place). Trainees are told that these presentations will be the only opportunity for the people from the other groups to learn about their projects, so material should be complete and delivered in a clear manner. They are encouraged to use visual aids. Each presentation should take approximately 20 minutes and is followed by a question and answer period. Trainers may encourage a discussion of key concepts or points of confusion that arise. After each presentation there is a short critique by the group which should address technical aspects as well as presentation style.

Resources and Materials:

- Hand levels;
- 1" x 2" boards of six to eight feet in length, markers and rulers to make hand-made stadia rods (sufficient materials to make one rod per pair of trainees);
- Dumpy levels with tripods;
- Stadia rods;
- Surveying flags or tape;
- Newsprint and markers and/or other materials requested for preparation of visual aids;
- Graph paper (for reports).

Trainer Notes:

- Written reports are required for the survey of the trainee's own pond with the hand level and for the group project. Trainees should be made aware of this when the projects are first assigned. Reports should include all data, presented in an organized manner, interpretation of that data, and the materials and methods used in the project;
- When group projects are assigned, it should be stressed that each member of the group should have hihe/sher own set of data and notes. It is not acceptable for one member of the group to serve as record keeper;

- The groups are told which trainees will present the group projects the afternoon before presentations. The reason for this is to ensure that everyone in the group gets involved and puts forth maximum effort to understand all aspects of the project;
- During the field work, trainers should circulate among groups as observers but should not get involved in discussions with or among the trainees or have any input into the implementation of the project. If necessary, trainers may clarify a point of confusion regarding the instructions given for the assignment, and they should assist in providing equipment or materials requested by the trainees if appropriate;
- Trainees should be told at least a day in advance how the presentations will be structured (i.e., time frames) and that there will be a question and answer period, and a description of the critique. There should be some discussion among the trainees about the purpose of the critique, what should be addressed, and how positive and constructive criticism should be delivered and received. This should be discussed again after the presentations are completed or before the next activity that requires similar critiques.

Session IV-3: Pond Interview - Week Four

Time frame: Approximately 10 minutes per trainee

Objectives:

- Evaluate trainees' technical comprehension, and ability and willingness to apply information;
- Motivate trainees to maximize their learning through making the best possible use of their ponds as learning tools;
- Help trainees identify aspects of their pond management that need further thought, modification or action.

Overview: This is not a session design. It is a set of trainer notes that describe the procedure used for implementing pond interviews. Although staff members interact with the trainees at their ponds several times a day, this time is used for more formalized interviews dealing specifically with the trainees' pond work. The interviews take place at the ponds. By asking the trainees specific questions about their management practices and the observations they have made, trainers not only have an opportunity to evaluate the trainees comprehension and work, but also provide the trainees with some food for thought and a reminder of their accountability in their pond work. The questions asked often help trainees focus on aspects of their management they would like to explore further, pique their curiosity about some aspect of their ponds or fish that they had not previously considered, evaluate some of the actions they have already taken in their pond work, or give them ideas for additional management activities.

- Each staff member is assigned certain trainees to interview;
- Each staff member carries a clipboard, on which he/she has one form for each of the trainees he/she is to interview. The forms have the date, the trainee's name, and the questions to be asked in the interview with spaces between each one for the trainer to make comments about the trainee's responses;
- Staff members should review the questions among themselves prior to the interviews. They should make sure they all interpret the questions the same way, that they are consistent in the kind of information they expect to obtain from each, and that they have similar ideas about the kinds of notes they will take during the interviews;
- When the trainees arrive at the training site, they are told to remain at their ponds until a trainer has spoken with them (they will be going directly to their ponds each morning for daily pond time in any case, but it is helpful to give them these instructions anyway in case interviews run late, or in case some trainees plan to spend part of their time away from their ponds to get fertilizer or do some other pond related task);
- For each interview, the trainer approaches the trainee at hihe/sher pond. The trainer informs the trainee, in a polite but formal tone, that he/she will be asking him/her some questions about hihe/sher pond this morning. The trainer has hihe/sher clipboard out and the form prepared so that he/she can make notes as the trainee responds to the questions;
- The trainer asks the trainee the questions listed on the form, noting down the trainees responses as well as other comments (for example, the trainer might note that the trainee knew a great deal of the information without looking in hihe/sher notebook, or

that the trainee seemed enthusiastic and eager to discuss hihe/sher pond work in depth, or that the trainee had extremely disorganized notes and was unable to find information requested, etc.);

- The trainer should try not to deviate from the questions listed, though an occasional follow-up question may be unavoidable based upon the trainee's response.
- Upon completion of the interview, the trainer thanks the trainee, provides information regarding the meeting time for the next activity (or whatever is appropriate), and leaves the trainee to resume hihe/sher pond work. The trainer should then go to a reasonably private location to quickly fill in any notes he/she needs to make on the form regarding the interview before continuing on to the next trainee.

- An example of a first pond interview form follows:

First Pond Interview

Date: __________ Trainee's Name: ____

1. What is the surface area of your pond?

2. What are your thoughts now about your stocking technique?

3. Exactly what did you stock? (Species, weight, number). How do you know?

4. What is actually in your pond now? How do you know?

5. What have you learned so far about the fish in your pond? (Should include whether or not they are on feed and how they know)

6. What have you learned so far about the water quality in your pond?

7. What have you done for your fish today?

8. May I please see your records?

9. How can you best use this pond to maximize fish production and your own understanding of fish culture? What are your short term plans for your pond for the next few days?

Session IV-4: Trainee Evaluation of Training - Week Four

Note: For objectives, overview and trainer notes regarding procedures, please see "Trainee Evaluation of Training - Week Two" in Chapter Eleven. The procedure is exactly the same each time, and the form is the same except for the activities that are listed.The actual content of the forms will depend upon exactly what activities have occurred.The only thing that will be included here is a sample of the form used for this week's evaluation.

Name (optional): ______________________________

1. On a scale from 1 to 5, rate the value of the following activities (0 = not at all valuable, 5 = extremely valuable). Please make comments or give suggestions for improvement;

Development of Management Plan (sections not addressed in first evaluation)

Field Trip to ________

Discussion following Field Trip regarding utilization of resources

Fish Dissection

Guest: (Name) (Introduction to Surveying)

Surveying Field Exercises and Presentations

Management of your own pond

2. How satisfied are you with your progress since your arrival at the training program? (very dissatisfied, dissatisfied, satisfied, very satisfied)

3. If you are not "very satisfied" with your progress, what factors are related to your own performance?

4. What factors are related to the training activities, resources, and/or staff?

5. Please rate the following aspects of the program that are not related to technical training. (Unsatisfactory, Fair, Good, Very Good). Please make comments or give suggestions for improvement.
Housing
Meals
Transportation
Medical Care
Addressing of Personal Needs (recreation, shopping, mail, etc.)

6. Additional Comments:

CHAPTER FOURTEEN

PROGRAM DESIGN - WEEK FIVE

Session V-1: Guest Lecturer - Site Selection, Pond Design and Pond Construction

Total time: 7 hours

Objectives:

- Provide in-depth information about site selection, pond design and pond construction;
- Provide opportunity to apply new information in the field under the instruction of an expert;
- Prepare trainees for upcoming training exercises.

Overview: Fish culture can only be successful if the ponds in which the fish are being raised function properly, and if good decisions were made from the beginning in choosing the site. It is therefore critical that trainees develop sound skills in the areas of site selection, pond design and pond construction in order to be effective in their jobs overseas. These aspects of the job tend to be intimidating to trainees and new volunteers because the price of any errors or bad judgement during the construction phase is very high and long lasting. There is a great deal of material to be learned, and to facilitate this process, especially given the time constraints of the program, a highly experienced expert should be brought in to teach the trainees the basic considerations, skills and techniques. In reality, a true ability to successfully practice these aspects of the job come only with experience, but this session provides the foundation that will enable trainees to begin building that experience base. Please note: The guest speaker will actually design his/her own session, with the staff simply notifying him/her of the time frames and general nature of the material they wish to have addressed. The following provides a general idea of a possible flow of events, based upon the way the expert used in this program designed his session.

Note: To prepare trainees for this session, they should be given a homework assignment the day before the guest lecturer is to visit. The homework assignment is to list all of the questions the trainees can think of regarding choosing a site for a pond, designing a pond and building a pond.

1. The meeting begins after morning pond time. The trainee facilitator introduces the guest speaker and tells the group about his/her credentials and experience. The speaker then begins the lecture, beginning with an outline of what will be covered and encouraging trainees to ask questions whenever they wish to. Since the morning lecture will probably be long, approximately four hours, a fifteen minute break should be taken halfway through the morning.

2. At lunchtime, the trainee facilitator provides the guest with a lunch. Lunch time is long enough to include pond time, usually an hour and a half. During this time, the guest may

choose to remain with the trainees to talk informally, or he/she may choose to take a break in the office.

3. After lunch and pond time, the meeting continues. The guest finishes covering his/her material, which should take approximately an hour more in the classroom.

4. When the guest has covered the planned material in the classroom, he/she takes the group out to the field for the next hour and a half or so. In the field, soil samples are taken with an auger and examined in light of the information received in the morning session. The speaker can then divide the group into two or three smaller groups, giving them an assignment such as doing a baseline and finding a contour at a given slope, or some other aspect of the material that was covered during the discussion on site selection and pond design. The guest circulates among the groups, providing guidance and clarification regarding questions that arise.

5. For the last thirty minutes or so, the group reconvenes in the field or in the classroom to discuss the field project and to ask any last minute questions. The trainee facilitator thanks the guest on behalf of the group, and the session is completed.

6. The session is followed by the normal end-of-the-day pond time.

Resources and Materials:

- Expert with knowledge and experience in all aspects of site selection, pond design and pond construction;
- Blackboard, chalk, eraser;
- Extra lunch for guest;
- Soil auger(s);
- Nearby area(s) where samples of diverse soil types can be found;
- Field or other area suitable for field exercise as designed by guest;
- Dumpy levels, tripods, stadia rods, tape measures and surveying flags (one set per 8 to 12 trainees) for field exercise.

Trainer Notes:

- The staff member who makes the arrangements with the guest expert should be sure to allow ample time for the guest to prepare the session. Provide information that will help the speaker understand what the trainees do and don't know, and will make it clear what it is hoped will be covered to meet the needs of the program;
- The trainee facilitator should be selected and notified by the staff ahead of time. He/she should meet with the visitor about twenty minutes before the meeting begins in order to conduct a short interview that will allow him/her to properly introduce the guest and provide information regarding credentials and experience;
- The trainer in charge of meals should arrange for an extra lunch to be ordered. The trainee facilitator should take responsibility for making sure the guest gets a lunch;

- Staff members should be present throughout the sessions and field exercises. They should take behavioral data and one should be assigned the task of taking notes on what the speaker actually says. This is helpful in developing quiz questions, or in case there is some confusion later about technical information that was relayed;
- It is important for the trainees to have already worked with the surveying equipment and be fairly comfortable with the concepts and practice of surveying prior to this session;
- Technical material to be covered in depth should include at least the following:
    - Criteria used in site selection;
        - Physical parameters: water sources, variety of soil types, topography, vegetation, climate, etc.;
        - Other parameters:
            - economic feasibility (construction costs vs. potential income from this pond(s);
            - market situation and proximity to market;
            - proximity to farmer's home;
            - danger of theft/vandalism;
            - accessibility to roads, to resources;
            - room for expansion;
            - farmer's skills, other interests and work;
            - availability of resources;
    - Water sources (types, characteristics of each, advantages and disadvantages of each;
    - Soils (types, how to identify, which are suitable to pond construction, considerations in construction that are dependent upon soil type, etc.;
    - Topography (common types of topography, slopes, what is a suitable slope, how different slopes affect pond design, how topography affects shape, orientation, size, and layout of ponds, etc.;
    - Types of ponds (diversion, barrage, watershed, contour, water table, etc.) and pond systems (parallel, rosary) including descriptions, construction considerations, advantages, disadvantages, suitability to various topographies, how different pond types can be used in combinations, etc.;
    - Designing and laying out ponds, following contours, use of gravity flow, staking out ponds for construction;
    - Parts of a pond (dikes, dike slopes, toes, top width, core trench, freeboard, storage, bottom slope, surface area, emergency spillway or overflow, drainage structures, inlet structures, anti-seep collars, etc.) and relative dimensions, options, considerations that determine dimensions, etc.;
    - Pond construction (all steps involved and sequence of all steps including scarification, tamping, compaction, cut and fill, calculating dike volumes, sealing bottom, dealing with trees or other vegetation, erosion control, etc.);
    - Specific types of drainage and inlet structures (monks, sluices, PVC standpipes, other pipes systems, Rivaldi drains, siphons, canals, etc.). Also discuss use of sleeves over pipes for bottom draining, special considerations regarding spillways and overflow structures (i.e. width and depth in relation to water flow, pond size, etc., dangers of screening overflow structures, etc.).

Session V-2: Quiz - Week Five

Total Time: 45 minutes

Objectives:

- Provide opportunity for staff and trainees to check trainees' comprehension of technical material and identify areas needing further clarification;
- Reinforce importance of learning credentials of a resource;
- Reinforce importance of taking thorough notes.

Overview: This quiz is given to the trainees the morning following the visit by the guest expert on site selection, pond design and pond construction.

5 minutes

1. Upon arrival at the classroom after morning pond time, the trainer informs the trainees that they will have 35 minutes to complete the following quiz. They may use their own notebooks. Do not begin counting the time until everyone has received their quiz.

35 minutes

2. Trainees complete quiz.

5 minutes

3. Quizzes are collected. Trainer discusses whatever is necessary for the next activity.

Resources and Materials:

- Either prepared newsprint with quiz questions (very large letters), or individual copies of the quiz questions for each trainee;
- Extra notebook paper and pens available in classroom.

Trainer Notes:

- The thirty five minutes allotted for this quiz is a tight time frame. If most of the group appears to need more time, be prepared to allow five or ten more minutes;
- While going through the completed quizzes, staff members should take note of material that still appears to be unclear to a large number of the trainees. These should be reviewed with the group;
- Following is a copy of a sample quiz:

Name: ________________________________

Note: You may use your notebook to answer the following questions:

1. Who was the visitor we had yesterday? What are his credentials and why is he qualified to speak about the topics he covered?

2. Name a variety of types of water sources and discuss advantages and disadvantages of each.

3. How might topography influence pond size, shape and orientation?

4. Why is it important to remove the topsoil from an area before constructing a dike?

5. Draw a detailed cross-section of a pond. Label all features and assign sample measurements.

6. Describe the different types of ponds and pond systems. Discuss the advantages and disadvantages of each.

7. Why is pure clay not recommended for constructing dikes?

Session V-3: Site Development/Pond Design

Total time: 17 hours (assuming 4 groups)

Objectives:

- Give trainees experience in site analysis and pond design;
- Reinforce and apply learnings from guest lecturer;
- Practice extension techniques;
- Use peer critique as a learning tool.

Overview: At this point, trainees are comfortable with the surveying equipment and techniques necessary to evaluate a site and design and stake out a fish pond. The guest lecturer on Site Selection and Pond Construction has provided other important information in these areas. In this exercise, trainees will have their first opportunity to put together all of these skills and concepts and apply them in a realistic situation. The reality of this type of work cannot be expressed in a classroom setting, so trainees find this field project very challenging and educational. Since this is one of the most intimidating aspects of the work they will do as volunteers, practicing during training is as critical to building confidence as it is to reinforcing the technical knowledge.

5 minutes

1. In the classroom, trainees are divided into small groups. They are told that they will be shown a water source and an area that is a potential site. They are to examine the site, then design and lay out an appropriate pond or pond system for that site. They might consider themselves as consultants, hired by a farmer to look at his land and design a pond, making the best use of the land. Professional quality is expected both in the technical aspects of the project and in the manner in which the information is presented. They should assume that there will not be access to pumps for moving water. They should design ponds to be 150 - 300 square meters in surface area. Although they will be working in groups, each person is to keep his/her own set of notes and diagrams, and should be able to present the site.

10 minutes

2. Trainees brainstorm a list of things they will have to measure or calculate at the site, while a trainer records their list on the board. The list should include:

Initial survey of area
Stake out center line
Stake dike toes
Top width of dike
Water levels at source
Placement of drain
Critical elevations
Cut and fill
Hours of labor.
Layout of ponds
Stake out core trench
Height of dike at each station
Slope of site and pond bottom
Freeboard
Type of inlet, drain, overflow
Stake canals, dimensions, slopes
Volume of dikes

5 minutes
3. The trainer demonstrates an extension technique used for defining dike shape and size to a farmer using bamboo and string. This technique is to be used by the trainees when they lay out their ponds. They are not limited to this method and are encouraged to devise their own extension tools. The technique referred to here is a simple one that works as follows: two pieces of bamboo (or some other straight poles or sticks) are placed in the ground at a distance apart from one another that equals the top width of the dike. The poles are sticking straight up such that the tops of them actually mark the top width of the dike. A piece of twine is tied to the point where the back toe will meet the ground at that point in the dike. That same piece of twine is then tied to each of the poles, and then to the point where the front toe will meet the ground so that the twine forms an outline of a cross section of the dike at that point).

5 minutes
4. Trainees are informed of the time frames in which they will be working, and that they will be presenting their sites to the rest of the group. The presentation is considered an extension exercise, and should include appropriate visual aids and demonstrations. Each presentation will be critiqued by the group for both its technical and extension aspects. Remind trainees that they will be working in field conditions (i.e., sun, heat, insects, snakes, etc.) and should take proper precautions and dress appropriately.

35 minutes
5. Trainees are then taken to the field and shown the sites that the staff has already chosen. They are shown the water source and the general area in which they can "build" their ponds.

12 hours
6. Trainees carry out this exercise in their groups at their sites. Trainers should circulate among the groups to observe and provide any necessary logistical support, but should not participate at all in the exercise or provide any input into the trainees' work.

4 hours
7. Each group presents its site to the other groups. Everyone in the group should have a part to play in the presentation. The presentation takes place at the site, not in the classroom. Presentations should take approximately 20 minutes, followed by 10 minutes of questions and answers, then 5-10 minutes for the critique.

Resources and Materials:

- Blackboard and chalk;
- Bamboo stakes or similar material;
- String;
- Tripod, dumpy level, stadia rod or hand levels and stadia rod for each group;
- Surveying flags or tape;
- Soil auger or shovels;
- Newsprint, markers, rulers, graph paper and/or other materials requested for preparing presentations.

Trainer Notes:

- It is important that trainers choose sites with care prior to this exercise. They should be sure the sites are feasible and be familiar with the areas used. Be clear about boundaries or other site specific instructions when showing the sites to the trainees. Also warn them of any special dangers (snakes, alligators, private property nearby, etc.);
- Since sites are in undeveloped areas and sometimes remote, a trainer should be with or near the groups as much of the time as possible. If it is necessary to leave trainees alone for short periods of time, be sure they know where to go for help if an emergency should arise in the absence of a trainer;
- Groups should be as small as possible depending upon the size of the group and staff, the number of available sites, amount of equipment, and logistical considerations. Four is a good size, six should be considered the maximum. The larger the group, the less opportunity there is for everyone to be involved in the decision making;
- If possible, groups should be divided for the presentations so that everyone sees several sites, but the number of people at a site at any time is small enough to allow everyone to see and to be involved in the discussions and critiques. This can be done in a few different ways. If there are several groups, then some can see some sites, the others can see the other sites. If there are less than six groups, it will be better to divide each group into two. Two large groups are then comprised of a few people from each of the small groups. In this case, all of the sites are seen by everyone, and there is more responsibility on each member of the small groups for the presentation of the site. Caution: The division of groups, order of presentations and logistics for getting around to each site in an efficient manner can be very complicated, especially if a site is to be seen twice by different groups. A trainer should have responsibility for working this out well in advance, and all staff members should be clear on the arrangement that has been determined;
- Before beginning the presentations, it is helpful to hold a short meeting in the classroom to discuss the format for the critiques. Allow the trainees to decide what they should be looking for during the presentations and commenting upon during the critiques. Suggestions for points to be covered and commented upon include:
    - General approach to examining the site, and the order and completeness of the general survey (i.e., soils, elevation of water source relative to drainage area, baseline or general topography, accessibility, proximity to road, etc.;
    - How well was the site utilized? (orientation of pond, consideration of equalizing cut and fill, shape of pond, size of pond, potential for expansion, consideration of trees or other obstacles, etc.);
    - General understanding of principles of fish ponds and how they function (i.e., relationships between critical elevation points;
    - Use of surveying skills (completeness, accuracy, apparent confidence in knowledge of concepts;
    - Completeness and correctness of pond design and layout (i.e., have all important components such as core, top width, dike toes, inlet, drain, water surface, freeboard, overflow, volume of dirt needed, cut and fill, etc, been marked, calculated, determined and included?);
    - Soundness of decisions made by the group (chosen top width, dike slopes, core depth, etc.) and accuracy of calculations;

- Presenters' familiarity with important information and numbers (depth, surface area, cut and fill, estimated labor, etc.);
- Is the pond staked out and presented in such a way that the finished pond can easily be visualized?;
- Presentation style, use and quality of visual aids, apparent familiarity and comprehension of the presenters regarding their data and design, ability to field questions.

Session V-4: Processing of Masonry Project

Total time: Approximately 2 hours

Objectives:

- Provide opportunity for group leaders to bring the project to a formal conclusion;
- Provide opportunity for trainees to review steps followed throughout the project and fill in gaps that individuals may have in their notes;
- Provide opportunity for trainees to critique their work, identify strong and weak points from both technical and organizational standpoints;
- Reinforce technical learnings and clarify points of confusion as necessary.

Overview: The masonry project involves many steps and is completed over a period of time. During that time, some trainees may be more involved in some steps than in others and may need to learn more details about the steps in which they were less involved. In addition, it is important to take time to assess the final product as well as the steps of the process used to achieve that product in order to identify strong and weak points, problems and solutions, etc. and draw conclusions that may be applied next time trainees need to tackle a masonry project. This meeting is facilitated by the group leaders for the masonry project. Near the end of the meeting, the trainer who was in charge of this project also offers his/her input.

Note: A short description of this session is given as part of the design for Masonry and Carpentry Projects in Chapter Twelve. The following is a review of the processing step in a bit more detail. If wheelbarrows were or will also be constructed, the processing of that project can take place as a supplement to this meeting or in a separate meeting depending upon scheduling and logistics.

1. The trainee group leaders facilitate a discussion of the project. This should take place mainly in the classroom in order to ensure that everyone can hear, see and participate, but should also include a walk out to the actual project site in order to look at the completed structure. This may occur at the beginning or at the end as the group leaders see fit, but if it occurs at the beginning, they should point out specific things the trainees should look at and be prepared to discuss.

2. The trainee facilitators should begin the session with a review of the entire project, chronologically, from beginning to end. The discussion should address:

- What actually occurred at each step (including preparation of site, design and construction of form, setting up and bracing of form, reinforcement, mixing and pouring of concrete, tamping, finishing, curing, removal of forms);
- What worked well, what didn't work well for each aspect;
- Suggestions for alternative or improved techniques, solutions or approaches;
- Special problems or difficulties encountered, solutions tried or recommended;
- Results (condition of finished product, what caused any unanticipated results;
- Economics (materials and tools used, costs of construction, time and labor, efficiency);

- Analysis of group organization aspect (i.e., effectiveness of group leaders, unique aspects of being a leader, unique aspects of being a group member not in the leadership role, how well group worked together, problems encountered, what helped, what people learned about themselves, what people learned about group projects.

The discussion should involved a lot of group discussion, sharing of ideas, asking and answering of questions.

3. Near the end of the session, the trainee group leaders should ask the trainer in charge for input. The trainer should provide insights on his/her observations, constructive criticisms, reinforcement of positive aspects, suggestions. The trainer should share any personal experiences and ideas, and give any helpful hints or techniques he/she may be able to provide.

4. The trainer should ask the trainees to spend ten minutes or so listing important points that came up during the discussion that they want to be sure to remember for next time they are involved in a masonry project, and/or a group project of any kind as either a leader or participant.

5. In concluding, the trainer should congratulate the group on the project and on the discussion, as appropriate, and should thank the group leaders.

Resources and Materials:

- Blackboard, chalk, eraser (in case trainees want to illustrate points or ideas, or if group leaders want to put up an outline for the discussion;
- Other materials group leaders may request (newsprint and markers, etc.).

Trainer Notes:

- The trainer in charge of this project should meet with the group leaders well in advance of this session. They should be given ample time to prepare and should provide suggestions for ensuring that the issues listed in step number two (above) are addressed. The trainer should ask the group leaders to allow time at the end for him/her to share some of his/her observations with the group. It is also a good idea to encourage the group leaders to take the initiative in critiquing their own leadership in the project, and encourage them to prepare themselves for both giving and receiving feedback in a constructive manner;
- The trainer in charge of this project should also be well prepared. Careful notes should be taken throughout the project in order to be able to provide good, accurate, useful input regarding observations the trainer made as trainees worked through all of the steps, as well as technical points that may have been overlooked, not clearly understood, or that can be offered to supplement the knowledge the trainees have. The trainer's input should also be provided in a constructive, positive and helpful manner;

- This project provides a perfect opportunity for trainees to feel a real sense of accomplishment. There will probably have been errors made, but if the errors serve to enhance the trainees' learning, then they will have been worthwhile. If the group tends to be very hard on themselves, the trainer should make a point of helping them put their errors into perspective. He/she should try to help the trainees recognize both their accomplishments and the new knowledge they obtained through the project.

Session V-5: Issues in Peace Corps Aquaculture Programming

Total time: 1 hour, 30 minutes

Objectives:

- Expose trainees to the issues they will face directly and indirectly as part of a complex government-to-government development project;
- Provide trainees with the broader context and framework of how what they are currently doing relates to their future work overseas;
- Alert trainees to common pitfalls faced by former fish culture volunteers and Associate Peace Corps Directors in project design and implementation.

Overview: Although trainees are caught up in daily training activities, it is important to step back at some point in the program and discuss the bigger picture. This session is partly a bridge to in-country activities, but it also serves the purpose of emphasizing the need for project planning and goal setting. The discussion helps ease trainee anxieties over their upcoming challenges and responsibilities overseas. Finally, trainees get a sense of the successful history of Peace Corps aquaculture programs, why their roles as extension agents are critical, and how the various administrative structures can promote or hinder the success of their own development efforts.

Note: This session should be facilitated by someone with varied and substantial Peace Corps fisheries programming experience. This discussion can be particularly effective when co-facilitated by the Project Director and the OTAPS Fisheries Specialist.

10 minutes

1. The facilitator(s) must start the session by introducing him/herself (themselves), giving particular emphasis to programming experience in fish culture or in the region to which the trainees are assigned. Also, the mood must be set by asking trainees to set aside, for 90 minutes, their ponds, training assignments, group projects, etc. Provide a simple definition of what is meant by "programming" and explain the importance of this to the trainees' personal situations.

10 minutes

2. Ask trainees about the experiences they had with Peace Corps just to get into the training program. Use this as a springboard to describe the structure and function of Peace Corps recruitment and placement. Include the roles of the host country ministries and overseas Peace Corps staff. Encourage relevant questions and direct the discussion to areas of highest interest.

40 minutes

3. This part of the session is more lecture oriented although questions are still encouraged. Because programming issues are largely outside of the trainees' experience at this point, the main objective is to expose them to some of the most important issues and sow the seeds for future discussions. The following list includes many of the key topics to be addressed:

- Project feasibility studies;
- Ministry approval and involvement;

- Generation of requests for volunteers;
- Program and project funding;
- Peace Corps/U.S.A.I.D. collaboration;
- Role of the Associate Peace Corps Director/Program Manager;
- Keys to successful aquaculture projects (intensity, independence, profit, simplicity);
- Role of training;
- Project goals (commercial/subsistence emphasis);
- Standardized technical packages;
- Project duration and the six-year plan;
- Posting including criteria for decisions;
- Fish stations versus extension;
- Peace Corps/Washington (especially OTAPS) role;
- Influence of politics;
- Counterparts;
- Sustainability and long-term impact.

30 minutes
4. The last part of this session should focus on what the trainees can do now in terms of preparation for handling these issues. This should start with the facilitator giving a lecturette on the importance of program planning and goal setting.The last fifteen minutes can be given to the trainees to brainstorm a list of actions they can take during training to better prepare themselves for the first three months at their posts. Ideally, if time permits, a separate two-hour follow-up session should be done just on program planning and goal setting. For an excellent design on this topic, see **Small-Scale Marine Fisheries Training Manual** (Session T-74, pp 497-500).

Session V-6: Introduction of Seminars and Seminar Topics

Total time: 1 hour 30 minutes

Objectives:
- Inform trainees about seminars;
- Announce seminar topics;
- Assign seminar topics to trainees;
- Distribute text books.

Overview: Up to this point, trainees have not had access to written materials, and most learning has been through observation, experience and field trips or visiting resource people. By working with their ponds, visiting other facilities, and doing a variety of field exercises that involved both application and communication of technical concepts, trainees have not only learned a great deal and acquired many new skills, but they have also been able to formulate much clearer, more specific questions than they had at the beginning of training. This point becomes evident during this session, and trainees have an opportunity to recognize the progress they have made. They know what they want to know, and they are very eager for information. At this point, they gain access to written resource materials and many other sources of information as they share responsibility for a series of in-depth, highly informative seminars.

5 minutes
1. The staff facilitator reviews training activities up to the present. The list of activities in which they have participated will include (at minimum) the following:
- Made observations of a pond system;
- Written detailed management plans;
- Handled and moved fish;
- Begun managing ponds;
- Dissected fish;
- Submitted technical reports;
- Had access to a variety of resource people through field trips and guest experts;
- Had field experience with surveying and pond design;
- Had experience communicating technical information in the classroom and in the field.

10 minutes
2. Ask trainees to individually brainstorm, on a sheet of paper, the questions they have about fish, fish culture and/or fish culture extension work. Tell them that this will not be handed in and will just serve as a tool for the next step.

5 minutes
3. Ask trainees for observations about the questions they have listed. Point out that through their hands-on work and interactions with resource people, their questions about fish culture and extension have become more focused and specific.

25 minutes
4. Divide trainees into small groups of about five each. Using their individual lists, they should develop a group list of the categories in which they have questions. Have them write this on newsprint.

20 minutes
5. Each group posts newsprint. Compare and discuss the lists.

Inform the trainees that since there is so much information to be addressed, an efficient means of doing so within the time constraints of training is necessary. Tell them that the areas they have listed will be organized into a set of topics, and that they will each be responsible for researching and presenting a seminar on a topic. Point out that these seminars will provide the bulk of specific information that they will receive in training, and that they are to be of very high quality. Also point out that they have a tremendous responsibility to one another to do an excellent job since they will be counting on each other for information on topics other than their own. Inform the trainees that, in fact, the staff considers these seminars so important that during the presentations, any seminar that is not of high quality will be stopped. "Not high quality" may mean inaccurate information, incomplete information, lack of organization, unclear or unprofessional delivery.

10 minutes
6. Explain that the staff has already organized the many areas they have cited into a list of seminar topics, and hang up a newsprint list of these topics. Ask the trainees to list their first three preferences for their seminar topic on a sheet of paper to be handed in. Tell them that the staff will assign their topics at a specified time later in the day. Explain that their choices will be considered, but that it is not guaranteed that they will be assigned one of the topics they have requested.

15 minutes
7. Trainees receive and sign for textbooks.

Follow-up
8. Following the meeting, the staff meets to decide on seminar topic assignments. In making this decision, the staff must take into account the trainee's preference, strengths and background. In addition, there will be some topics that have been requested by many trainees, and others that have not been on anyone's list of choices. The seminar assignments are posted later in the day.

9. Trainees are informed that they are to turn in outlines of their seminars the following morning. Outlines are to be done individually at this point, even if a topic is assigned to a pair of trainees rather than a single trainee.

Resources and Materials:
- Newsprint, markers and masking tape;
- Prepared newsprint list of topics;
- Flip chart stand (optional);

- Notebook paper, textbooks and other materials to be distributed to trainees;
- Sign-up list for documenting that trainees have received books.

Trainer Notes:

- An alternative design for this session is to have the trainees use their lists to compose their own list of seminar topics. When this alternative design was used in past programs, the session took much longer because the group usually had difficulty reaching an agreement. In addition, it was impossible to be assured that all necessary topics would be included. The method described in this session has proven to be more successful;
- The way the seminar topics are organized and divided among the trainees depends upon the number of trainees in the group, and to some extent, the backgrounds of the trainees. A typical list of topics and breakdown among trainees is as follows (for a group of 25 trainees):
  - Extension/Administration - 2 trainees
  - Site Selection/Construction - 3 trainees
  - Anatomy/Physiology/Taxonomy - 2 trainees
  - Stocking/Sampling/Growth - 2 trainees (*)
  - Feeds/Feeding - 2 trainees (*)
  - Water Quality/Fertilization - 2 trainees
  - Handling/Parasites/Disease/Predators - 2 trainees (*)
  - Reproduction/Genetics - 2 trainees (*)
  - Harvest/Transport/Processing/Preservation/Preparation - 3 trainees
  - Marketing/Economics - 1 trainees
  - Levels of Intensity/Complexity/Alternative Management Strategies - 2 trainees
  - Pond Ecology and Maintenance - 2 trainees

- For a smaller group, the topics followed by (*) can be assigned to one person rather than two. For a larger group, the group can be divided so that there are two complete sets of seminars. The advantage of this is that there is generally more discussion and questions during the presentations if the groups are not too large. The disadvantages are that the staff can become overextended and the logistics can be complicated.

- Pond Ecology and Maintenance replaces the topic entitled Pond Management that was formerly used. With the addition of the Levels of Intensity topic and some of the other changes that were made in the program over time, much of the material that used to be included in the Pond Management seminar (for example, integrated agriculture and alternative culture systems) has been included in other seminars. The Pond Management seminar therefore became more of a general integration of most of the other topics from a broad perspective. The title Pond Management no longer quite fit and actually seemed to cause some frustration to the trainees assigned to that seminar as they had difficulty defining their role. Thus, it is hoped that this modification of the title as well as restructuring of the content forms a new, substantive seminar topic.

Session V-7: Fish Fry

Total time: 9 hours

Objectives:

- Learn and practice various techniques for processing fish;
- Learn and practice a variety of ways to prepare fish;
- Ensure that all trainees are willing and able to eat fish, and provide opportunity for them to taste the fish they are raising;
- Gain experience in group organization and coordination in the implementation of a complicated event;
- Practice interpersonal skills and protocol at a formal social function;
- Express appreciation to members of local community who have provided assistance.

Overview: The fish fry is a multifaceted activity that serves both as a learning experience and as an enjoyable social event and break from the usual routine. The trainees have complete responsibility for everything including planning and organizing, harvesting and processing the fish, cooking, meeting and interacting with invited guests, and clean-up.

30 minutes

1. The trainer who is assigned to supervise the fish fry meets with the trainee fish fry coordinators. The trainee coordinators are informed that they will be responsible for overseeing all aspects of the fish fry. The following information, suggestions and requirements should be covered in this meeting:

- Date and location of the fish fry;
- Though they have ultimate responsibility, the coordinators should delegate tasks to the rest of the group. This is best done through the formation of committees, each of which has responsibility for a specific aspect of the fish fry. Submit a written list of committees and their members to the trainer;
- All trainees must take a turn processing fish;
- All trainees must serve on at least one committee;
- Any questions the other trainees have should be addressed to the trainee coordinators. Only the coordinators should make requests of the trainer;
- Coordinators should have a contingency plan for bad weather;
- Fish processing should include scaling and gutting, fileting and butterflying;
- Fish must be prepared in a minimum of four different ways, one of which should be smoking. Other methods and recipes may be determined by the trainees;
- Clear deadlines for submitting shopping lists, requests for equipment, etc.;
- Any restrictions or ground rules regarding use of the kitchen or other facilities, alcoholic beverages, etc. should be discussed. In addition, coordinators may establish their own rules;
- How guests will be invited (trainees may invite them, or it may be preferable to have them submit a list to the trainer and have the staff invite them);

5 hours

2. Starting about noon on the day of the fish fry, fish are harvested. As they are harvested, they are given to the members of the processing committee and processing also takes place.

As fish are processed, they are given to the cooking committee to be prepared. Those responsible for setting up the site do so - setting out tables and chairs, dishes and utensils, decorations, etc. All preparations of the site should be complete by the time guests begin to arrive.

Fish are prepared in a variety of ways. Smoking is one method of preparation that is required.

All guests are individually greeted as they arrive by at least one or two trainees.

2 hours
3. Food is served and eaten.

1 1/2 hours
4. After guests have left, the site and all facilities are thoroughly cleaned.

Resources and Materials:

- Fish of edible size and in sufficient quantity (approximately three quarters to one pound live weight per person);
- Harvesting equipment (seines, tubs, buckets);
- Platforms for processing fish (be sure surfaces are protected, can be used for cutting, and can be cleaned sufficiently to provide a sanitary work surface;
- Filet knives, sharpening stones, skinning pliers if using catfish;
- Gloves for protecting hands while processing fish;
- Cooking facilities (should include at least a grill and a smoker. A stove and oven are helpful and allow for more variety in preparation methods;
- Sufficient pots, pans, spatulas, serving pieces, kitchen knives, etc., as required;
- Aluminum foil, wax paper, plastic wrap, similar items as requested;
- Refrigeration for food prepared in advance and for storing perishables;
- Sufficient tables and chairs to accommodate all trainees, staff and invited guests;
- Groceries, spices, condiments, etc. as requested by trainees;
- Sufficient dishes, napkins, utensils, cups, tablecloths;
- Cleaning supplies for dishes, tables and site;
- Invited guests may include support staff at training site, resource people who have worked with trainees, local officials, etc.

Trainer Notes:

- One trainer should be assigned to be in charge of this exercise. Trainee coordinators should work only with this trainer to avoid confusion and inefficiency. The trainer should communicate only with the trainee coordinators and should not undermine their authority with the rest of the group;
- For the first fish fry, the trainee coordinators should be the trainees who present the Harvesting, Transport, Processing, Preservation and Preparation seminar;
- The trainer in charge must be completely familiar with all rules regarding the cooking facilities, purchasing procedures for groceries, and all other logistics and restrictions.

Since this is a departure from the way meals are normally handled, failure to be well informed can cause problems;

- The trainee coordinators may determine what committees should be formed and how trainees will be assigned to committees (they may choose to assign people, or they may use sign-up lists so people can volunteer, etc.). Suggested committees include, but are not limited to:
    - Harvesting committee;
    - Processing committee;
    - Set-up committee;
    - Greeting committee;
    - Cooking committee (may be broken down to salad committee, fish committee, side dish committee, dessert committee, etc.);
    - Clean-up committee.

  Each committee may submit its own list of equipment, food, etc. to the coordinators. The coordinators must compile these lists and give comprehensive requisitions to the trainer;
- Coordinators should submit a complete plan to the trainer several days before the fish fry. This should include a list of committees and a time schedule. Trainees may ask to do some preparation in advance (for example, marinating fish for smoking) and should be permitted to do so if possible;
- For smoking fish, a smoker can be provided, but it is preferable that they use the smoker that was built as part of the Processing and Preservation seminar;
- If available, have trainees fry fingerlings in addition to the larger fish. A trainer may need to show them how to do this.

Session V-8: Personal Interview - Week Five

Objectives:

- Provide opportunity for trainees to assess their performance to date and their progress since the last interview;
- Check with trainees again regarding their feelings about being in the program and their level of commitment at this point;
- Provide opportunity for each trainee to receive feedback from the staff regarding his/her performance in the program and progress since last interview, especially in areas specified in the last interview;
- Reinforce strong points of each trainee's performance and discuss strategies for continuing to improve weaker areas or new areas of concern;
- Spend time with each trainee, on an individual basis, to provide an opportunity to express any concerns or discuss any issues he/she may care to share with the staff.

Overview: Trainees prepare for this interview by reviewing the self-assessment forms they filled out for the last interview and thinking about their progress since that time, especially in areas they targeted as wanting to work on. Staff also reviews their notes from the last interview so that there is a sense of continuity. In the last interview, which took place towards what was probably the end of an adjustment phase into the program, the questions posed at the beginning encouraged the trainee to focus on what they left behind and on the decision they made to join Peace Corps. The questions posed in this interview deal more specifically with what is going on regarding the trainee's work and progress in the training program.

1. Trainees are asked to prepare for this interview by reviewing the self-assessment forms they filled out last time. They are encouraged to think about their performance in the different areas since that interview, and to take special note of any changes in the ratings they give themselves. They should also concentrate on the areas they targeted for improvement and analyze how well they have implemented the strategies they developed with the staff for making those improvements. They should jot down notes about anything they wish to discuss and about issues in which they specifically want to request feedback.

2. As in the last interview, this one will be conducted by the Master Trainer and at least one other trainer. The Master Trainer greets the trainee, reminds him/her that the staff members might jot down a few notes to remind themselves of points they want to cover, and asks the trainer to begin the interview.

3. The trainer asks the following questions. Again, these are suggestions, but the actual follow-up questions and/or order will vary depending upon the trainee's responses and/or concerns expressed;

   - How does the way you look at your pond now differ from the way you looked at it the first week you had it?
   - What have been some of your high and low points over the last few weeks?

4. The Master Trainer asks the trainee what kind of feedback he/she would give him/herself at this point in the program.

5. The Master Trainer discusses the points raised by the trainee, and also encourages the trainee to bring up any other points or issues he/she wants to discuss regarding his/her performance. The Master Trainer provides feedback from the staff's point of view regarding the issues raised by the trainee, as well as any other feedback the staff feels appropriate including comments on areas in which the trainee requested further feedbac k at the previous interview.

6. The Master Trainer asks if there is anything else the trainee would like to talk about.

7. The Master Trainer concludes the interview by asking the trainee about his/her short term plans for then next two weeks, and asking if there is anything in particular the trainee wants the staff to be prepared to discuss at the next interview. The Master Trainer and trainer thank the trainee and end the interview.

Resources and Materials:

- Comfortable, quiet, private location to meet;
- Both the trainee and the staff members should bring notes from the previous interview as well as notes about issues they wish to discuss in this interview;
- Copy of the self-assessment form from the first interview.

Trainer Notes:

- Please review Trainer Notes from week three interview (Chapter Twelve);
- If the first interview went well, a sense of trust should have been established so that this interview can be an open exchange;
- At this point in the program trainees are very busy and generally very involved in their work. They are usually so focused on what they are doing in training that, at this point, they are not really thinking about working overseas. In the next interview, the questions will be designed to help the trainee put their training into the context of what they will be doing overseas, but for now the concentration is on what is occurring in their work in training.

CHAPTER FIFTEEN

PROGRAM DESIGN - WEEK SIX

Design VI-1: Seminar Preparation and Presentations

Total time: approximately 102 hours

Objectives:

- Provide trainees with in-depth technical and practical information on various aspects of fish culture and extension;
- Provide experience in organizing, researching and presenting information;
- Practice public speaking and using a variety of extension techniques.

Overview: Trainees receive input from staff on the content of the seminars and do an abbreviated practice run-through for staff prior to their actual presentation in order to help fine tune their organization and style of delivery. Through preparing and presenting their own seminars and listening to each others' seminars, they obtain a tremendous amount of technical and related information. They get valuable practice in effective communication and in utilizing a wide variety of extension techniques. Each seminar is followed by a peer critique so the trainees can receive immediate feedback on their presentations. Seminars cover a tremendous amount of material and are typically of very high quality.

30 minutes per topic
1. Once seminar topics have been assigned and trainees have turned in a first draft of an outline on an individual basis, the staff schedules meetings with the individual or team assigned to each seminar topic. At this time, the staff discusses the outlines with the trainees, adding any points that should be covered in the seminar that were not in the outlines, or deleting points that will be covered elsewhere or are not necessary. The staff informs the trainees of any special considerations, potential problems or suggestions that may help the trainees during their preparation, and encourages the trainees to request any resources, materials or other items they may need as soon as possible.

Approximately 36 hours
2. Trainees do research and other preparations for their seminar presentations. They may utilize the texts they received, the on-site library, local human resources, and experimentation they may choose to do at the ponds. In addition, staff may help set up interviews with experts based on descriptions of the kinds of resource people to whom the trainees would like to have access. This may take place through telephone interviews or personal appointments. The degree to which staff actually serves as resources for the content of the seminars varies with the topic and accessibility of outside resource people.

Throughout seminar preparations, the staff should meet frequently with the trainees on an individual basis to discuss their research and to ensure that the topic is covered thoroughly. Staff is available to fulfill requests for materials and set up interviews with appropriate resource people.

Approximately 60 hours
3. Trainees present seminars. Following each presentation, the group critiques the presenters on clarity, completeness,organization, and presentation style.

Resources and Materials:

- On-site library that contains a wide variety of textbooks, journals, reprints, industry newsletters, sample extension materials and any other publications that may be useful.
- If possible, access to a public or university library.
- Access by phone or personal visits to a variety of resource people who are experts in the fields being researched. Some examples include local extension agents, agriculture economists, agricultural processors, feed mill employees, fish or animal nutrition experts, contractors with experience in pond construction, masons, fish farmers, fish disease diagnosticians, live haulers, water quality experts, and aquaculture specialists with experience with small-scale, simple operations and large, high-tech operations.
- Comfortable, quiet, well-lit facilities with tables and chairs.
- Notebook paper, pens, pencils, colored pencils, graph paper, rulers, index cards, glue, other office supplies.
- Newsprint, markers, poster board, poster paints, flip-chart stands, masking tape, chalk, blackboard, modelling clay, mason jars, lumber, nails, wire screen, wire, twine, clean 50 gallon drum for making smoker, dissecting kits, potassium permanganate, salt, goggles, rubber gloves, vast assortment of other materials as requested by trainees for preparation of visual aids and demonstrations.
- Equipment from tool shed to be used for demonstrations such as water testing kits, assorted seines and dip nets, buckets, tubs, shovels, soil auger, transport tank, aerators, saws, hammers, tape measures, surveying equipment, etc.
- Extra fish for trainees to practice demonstrations in sexing, dissection, taxonomy, etc.
- Pick-up truck for transport demonstration and running errands.
- Comfortable classroom facilities for presentations.

Trainer Notes:

- Preparation for seminars and the actual presentations are extremely time consuming and intense. This two week period tends to be a very tense time for the trainees as they put in long hours, feel a lot of pressure and nervous anticipation. There is a lot of dependency on staff to provide needed materials and access to resources. Staff should be aware of this and be as supportive and cooperative as possible. Efficiency in providing requested materials will prevent undue stress and allow trainees who have been responsible enough to put in their requests in a timely fashion to get properly prepared without having to work in a frenzy at the last minute.
- The logistics involved in picking up the diverse and largely unpredictable materials that are requested by trainees, providing guidance and encouragement, scheduling interviews with resource people, and driving trainees to meetings or outside libraries can become quite complex. As much prior planning should be done as is possible, and staff members should be assigned to specific tasks. For example, the trainees should be told to submit all requisitions for materials and equipment to the trainer in charge of inventory, and this is the trainer who is responsible for obtaining and distributing that

material. Another staff member should be responsible for contacting resource people and setting up appointments. Try to divide up the tasks among the staff so that the trainees needs can be met as quickly and efficiently as possible.

- One trainer should be in charge of setting up the on-site library, including a catalog that is cross-referenced by at least title and subject. This trainer should choose one or two trainees to oversee the use of the library and make sure it is maintained in an orderly fashion. The trainer should inform the trainees of all rules and restrictions regarding the checking out of library materials. These rules should be determined well in advance of the time the library is opened to the trainees. Some things to consider include length of time for which an item may be checked out, whether or not trainees are permitted to bring materials to the living quarters, accountability for items if the trainee who has checked something out shares it with another trainee, and keeping the shelves neat and the materials in order.
- Staff should meet frequently with trainees working on each topic throughout the week of preparation to track progress and provide input. At some point, preferably a few days prior to the actual presentation, staff should schedule a practice run-through with each individual or team. This can be an abbreviated version of the presentation, but should provide the staff with a good sense of the content, flow and organization. This is also a good way to test the effectiveness of visual aids and demonstrations. Staff should give trainees direct feedback and suggestions immediately following the practice run.
- Time frames for the seminar presentations vary according to the topic, the required demonstrations and the quality of organization of the presentation. The range is generally from about two hours to six hours.
- When trainees meet with the staff to discuss their outlines, they may ask about the length of the presentation. Tell them there is no set time limit, but point out the series of seminars are to be done in about a week. Ask them to give the staff an estimate of their time requirement as they get further into their preparations.
- Point out to the trainees that once seminars begin, there is little time available for further preparation, so everyone should be ready to go when the first seminar begins. Be sure they understand that if a seminar is stopped, the next seminar in line will be expected to go immediately.
- Once presentations begin, pay special attention to trainee mood swings and energy levels. It may be necessary at times to cut off a seminar that runs late into the evening when the group is obviously too tired to absorb any more information.
- During the meeting in which the seminars were introduced,trainees were informed that presentations would be stopped if they were not high enough in quality. The decision to stop a seminar is not made lightly, but it is not unusual to have to stop one or two seminars during a series. Reasons for stopping may include: inaccurate information is being disseminated, the material is incomplete, the presentation is disorganized, the style of the presentation is confusing, unclear or unprofessional. (It may also be necessary to stop a presentation because the audience is not attentive, because of a time factor, or other some other situation that is unrelated to the job being done by the presenters; this type of situation is not what is being referred to here). If it is necessary to stop a presentation, the following should be kept in mind:
  - If the problem is not too serious, it may be possible to take a short break rather than stop the seminar altogether. This may be the case in a situation where the

presenter is very nervous and just needs to collect his/her thoughts, or if there is a single confusing point that needs to be clarified that the trainee can straighten out by checking briefly in his/her notes or a book.

  - The way the staff handles stopping a seminar is very important, especially in light of the tense emotional state that prevails during this period. The best approach is to call for a break and speak to the presenter(s) privately outside the room. Often, they will realize that they are having some difficulties and will decide on their own that they should stop and do further preparations.
  - In many cases, the trainee has been working hard and is having problems due to nervousness, lack of sleep, or lack of experience that has resulted in poor organization. It is extremely important to be sensitive and supportive. The trainee may feel that he/she is letting down the rest of the group, and it is critical not to further undermine the individual's confidence. Point out some of the positive aspects and offer to meet later in the day to help the trainee develop a strategy for getting whatever the problem is under control. Then be sure to do so.
  - There are other cases where it is less evident why the trainee is having a problem. Sometimes it really is due to a lack of effort on the part of the trainee during the preparation phase. Even if you suspect this is the case, any trainee is feeling vulnerable at the moment when his/her seminar is being stopped. This is not the time for lengthy reprimands or lectures, though an interview in the near future might be in order. For the moment, simply point out the problems and arrange to meet later to discuss what will need to be done to prepare for a make-up presentation.
  - Never reprimand or belittle the trainee, or otherwise cause him/her embarrassment or humiliation in front of the group.
  - After speaking briefly in private with the trainee, return to the classroom and inform the group that the seminar will be continued at another time. Ask the presenters of the next seminar how long they will need to set up, and set the time for that next seminar to begin.

- For each seminar, the staff assigns specific demonstrations to complement the lecture. Trainees are encouraged to develop and utilize other demonstrations,visual aids, and a variety of extension techniques.
- Attached is a set of sample outlines of the basic requirements for each seminar topic. Trainees must include detailed information on the material in these outlines, though they can supplement them with additional material that they feel is relevant or interesting. Outlines include required demonstrations.

Seminar: Extension/Administration

Note: This will be the first seminar presented. One of the responsibilities of this group is to model a good seminar. Since seminars are, in themselves, a form of extension, this presentation should help the other people to do a better job on their own seminars. Guidelines should be given for how to deliver an effective seminar. Organization, preparation and use of visual aids should be stressed. This group will facilitate the critiques following each seminar and give a wrap-up at the end of seminar week. They will point out what techniques were used during the presentations and facilitate a discussion of which techniques were the most/least effective, etc.

Presenters of this seminar will describe a wide variety of extension techniques. They should utilize as many of these techniques as possible throughout their presentation.

I. Define extension.
  - Point out that extension is basically the same in any culture, including the U.S.
  - Discuss extension education as opposed to giving instructions.
  - Discuss how psychology and sociology are part of extension.
  - Discuss "intensive" vs. "extensive" extension.
  - Flow of information: Research ↔ Extension ↔ Farmer

II. Characteristics of a good extensionist
  - Professionalism/Credibility
  - Active listening
  - Cultural/social sensitivity
  - Communication and interpersonal skills
  - Powers of observation/perception
  - Recognition that extension is a 7-day, 24 hour job
  - Extensionist is part of a community, must understand that community
  - Good role model

III. Gathering and filtering information
  - Perception/assessment of needs/avoiding bias
  - Asking the right questions
  - Utilizing resources

IV. Goal Setting
  - Being realistic
  - Programmatic goals (knowing where you fit into the "Big Picture"; the larger plan)
  - Volunteer goals
  - Farmer Goals
  - Dangers of overextending

V. Farmer selection
  - Setting criteria
  - "Innovator, early adapter, moderate, diehard"
  - "Dropping" farmers, saying "no"

VI. Extension Methods/Techniques

- Farmer visits
- Meetings
- Contact farmers
- Discuss group dynamics and how to use groups
- Acceptance of new ideas
- Developing a feeling of community
- Cooperative projects (possible advantages/disadvantages/problems)
- Tools:
  - Appropriateness/effectiveness of each in different situations/local cultures
  - Specific suggestions, i.e., mechanics of a visual aid (a flip chart shouldn't flop over while in use)
  - Advantages/disadvantages, possible hidden problems with some of these tools:
    - analogies
    - visual aids
    - demonstrations
    - sharing individual/common experiences
    - songs
    - role plays
    - field trips
    - workshops/seminars
    - games
    - incentives (awards, "decorations", etc.)

VII. Model farmers

- Definition
- How to make them part of an extension program
- Quality vs quantity

VIII. Appropriate technology

- Definition
- Examples
- Avoiding preconceptions and bias in either direction(i.e., assuming something can't be done if lack high-tech equipment when some appropriate substitute could be developed versus "tripping over the PVC pipe while looking for the bamboo")

IX. Case studies

- Determining feasibility and possible ramifications of extension projects.
- Discuss "hidden effects", possibility of unforeseen ramifications, effects on social structure, local economy, etc.

X. Working with counterparts

XI. Administration

- Working within a bureaucracy or several bureaucracies simultaneously
- Importance of knowing both formal and informal organizational structure

  - Chain of command (where you fit in, what happens if you skip steps, "short circuit" the system)
  - Working with "superiors/subordinates"
  - Motivating others
  - Program planning and evaluation
  - Project proposals

XII. Records and reports
  - Importance of record keeping and report writing
  - Considering and meeting the needs of the reader/user
  - Professional presentation

Demonstrations:
- Develop analogies for some of the topics covered in other seminars
- Demonstrate several extension techniques as part of presentation (role plays, analogies, games, teaching a skill using a few different methods, use of a variety of visual aids, etc.)
- Develop sample record-keeping formats for fish culture extension

Seminar: Site Selection/Pond Construction

I. Site Selection

- General considerations/principles: farmer's objectives, resources, other crops grown in area, possible future use of area, minimizing work for maximum quality ponds, market potential, etc.
- Water:
  - Compare advantages and disadvantages of various sources:i.e., well, stream, source, watershed, irrigation, swamps, etc.
  - Discuss importance/difficulties of gathering information regarding reliability of water sources.
  - Consideration of social mores, evaporation,seepage, tidal fluctuations, hottest/driest part of year
- Soils: Describe, discuss various soil types, their composition, characteristics and suitability for fish pond construction.
- Topography:
  - how various topographies (including various valley types and slopes, lend themselves to certain pond design (shape, size, orientation, etc.)and how they affect cut and fill
  - taking advantage of natural topography
  - potential for expansion
- Accessibility to farmer, market, resources, etc.

II. Pond design

- Basic types (barrage, diversion, watershed, groundwater, etc.)
- Advantages and disadvantages of types of ponds
- How different pond types can be used together
- Options for layout of multi-pond systems (include rosary and parallel systems, advantages and disadvantages of each)
- Management considerations regarding pond design
- Use of canals

III. Pond Construction

- Staking out a pond (special consideration to making this understandable to a farmer).
- Cut and fill (importance, methods to equalize)
- Cores
- Dams (toes, side slopes, top width, height, etc.)
- Volume of dam
- Compaction
- Slopes (pond bottom, canals)
- Drainage/Inlet structures (monks, sluices, pipes, canals)
- Anti-seep collars
- Emergency spillway/overflow (purpose: emphasize point is to save pond, not fish, options, important characteristics
- Sealing pond bottom (bentonite, gley, etc.)

- Machine vs. hand labor
    - compare cost/time to build 200 and 600 square meter ponds using bulldozer or hand labor
    - compare time to move a cubic yard of dirt
- Flow rates of different diameter pipe

IV. Masonry

- Basic definitions (masonry, concrete, cement, mortar, aggregate, rebar, curing, etc.)
- Design, construction and preparation of form
- Use of reinforcement
- Concrete: choosing appropriate mix, mixing, pouring, curing.

Demonstrations:

- Get samples of many different kinds of soil. Have trainees handle them dry and wet. Do experiments/demos showing water holding properties of different soils.
- Demonstrate several appropriate field tests for evaluating suitability of soils
- Use a simple model (sandbox type) to show how topography affects layout of ponds,clarify meaning of cut and fill and how topography and placement of pond can affect it, illustrate pond types and options for combining types of ponds, etc.
- Demonstrate use of string level, A-frame and compare accuracy of string level, A-frame, hand level and dumpy level
- This group will oversee actual pond construction and,possibly, masonry projects done by the group.
- Give assignment to trainees to be turned in before field trip: design a monk form,illustrate the design clearly and completely so that a carpenter could actually built the form from that illustration.

Seminar: Anatomy/Physiology/Taxonomy

Note: This seminar can become much too academic. Caution trainees about this. Tell them to keep information geared toward the practical and not to bog down in too much detail, especially in physiology. They should spend the most time on things that are unique to fish (i.e., they do not have to spend a lot of time discussing the function of the heart or brain). A good approach to suggest is that the seminar be geared toward giving people an appreciation for the unique and fascinating ways in which this animal with which they are working is adapted to its environment.

I. Anatomy (definition, purpose)
- External: mouth orientation, body shape, bilateral symmetry, total and standard length, fins, spines and rays,scales, sensory organs, openings, coloration, etc.
- Internal: digestive organs (Feed seminar will address adaptations of the digestive system), reproductive organs, respiratory and circulatory organs, etc.
- Age determination

II. Physiology (definition, purpose)
- Compare physiology of aquatic and terrestrial organisms throughout this section
- Respiration and circulation
- Digestion and excretion
- Osmoregulation
- How fish respond physiologically to their environment and to various water quality conditions (include brown blood)

III.Taxonomy (definition, purpose, overview of history, methods)
- How to use a taxonomic key
- Morphology, meristic counts
- How to look at a fish when attempting to identify it
- Practical application of taxonomy
- Potential problems, difficulties, reasons for confusion in the area of taxonomy

IV. Tilapia species
- Briefly discuss history of taxonomy of the tilapiine fishes, why literature is confusing, frequency of changes in system, interbreeding, numerous strains,geographical distribution, etc.
- Explain most commonly used system:
  - *Oreochromis* (maternal mouth brooders)
  - *Saratherodon* (paternal or biparental mouth brooders)
  - *Tilapia* (substrate brooders).
- Discuss taxonomy of *O. niloticus, O. aureus, T. zillii, O. mossambicus, T. rendalli* and *S. galilaeus*
- Make a chart with basic information on these species including feeding habits,tolerances, reproductive habits, etc.

V. Other species (other tilapias and/or other fish) cultured in the countries to which the trainees are assigned.

Demonstrations:

- Lead all trainees in the dissection of a fish (each trainee dissects a fish individually). This should demonstrate not only the anatomy of the fish, but should be a lesson in how to dissect a fish properly.
- Key out as many tilapiine species as are available,with at least one representative of an *Oreochromis* and one representative of *Tilapia*. If desired, key out some other local species as well. Try to use a good variety of genera and species.

Seminar: Stocking/Sampling/Growth

I. Stocking

- Review considerations and steps involved in making a stocking plan. (Suggestion: use the stocking plans they did for their own ponds as an example, perhaps redo a stocking plan for one of their ponds now that they have more knowledge). Considerations should include:
  - Determination of stocking density
    - Carrying capacity
      - Factors that affect carrying capacity
    - Stocking purpose
    - Use of biomass vs number to express carrying capacity, etc.
    - Growth rate
    - Mortality
    - Effects of over and understocking
  - Fish selection
    - Species characteristics
    - Other factors: farmer goals, pond characteristics,availability, etc.

II. Sampling

- Purposes
- Methods (cast net, seine, traps, electro-shock, lift nets, mark/recapture etc.)
- Sample size, frequency
- Interpretation of sampling data
- Condition factor
- Weighing and measuring fish (methods, special considerations)

III. Growth

- Factors that affect growth
- How stocking density can affect growth
- Calculating and evaluating growth and FCR
  - projecting harvest times
  - adjusting feeding rates
- Normal growth patterns
- How growth is expressed (growth rate rather than % growth)
- Age versus size
- Define "indeterminate growth" and "compensatory growth"

IV. Nets (Note: This section may be covered in the Harvest/Transport Seminar rather than in this one, or responsibility for this information can be shared between the two groups.)

- Parts of a seine, cast net
- Describe different types of nets and their uses
- Describe different types of mesh, how netting is measured, etc.
- Care of nets (treating, sunlight, drying, hanging, etc.)

Demonstrations:

- Teach trainees to weave netting: give assignment for swatch that will fit on a sheet of notebook paper, half inch mesh. (Note: this can done on the field trip.)
- Teach trainees to hang a seine.
- Demonstrate the use of a cast net.
- Set up an aquarium. Stock it with fry and maintain and monitor these fish throughout the rest of the program. Keep track of feeding rates, growth, FCR and other relevant information. Put up a chart and keep the rest of the group informed of progress and results.
- When discussing sampling, do an example that applies several of the topics covered. Follow a real or fabricated set of data from a pond of fish. Show what information is learned at each sample, and how that information in interpreted, how FCR, growth rate and condition factors are calculated, and how the information is used to make management decisions. This can be done through flip charts that are filled in as you discuss them, handouts or other tools.

Seminar: Feeds/Feeding

I. Feeds
  - Nutritional requirements of fish: differences for fry, food fish, broodfish
  - Nutrients in feeds
    - which nutrients supplied by different foodstuffs
    - complete vs. incomplete diets
    - complementarity in proteins
  - Forms of fish feed: pellets, crumbles, meals, etc.
    - compare properties, advantages and disadvantages of floating vs. sinking pellets, describe how pellets are made
  - Storage of feed: results of improper storage (i.e., aflatoxins, loss of nutrients, etc.)
  - Use of blood in fish feed
  - Formulating feeds: least cost formulation, use of agricultural by-products
  - Feed Conversion Ratios (from the nutritionist standpoint)

II. Feeding
  - Choosing the feed appropriate to the fish (size, form, content for fry, foodfish, broodstock
  - Getting fish "on feed"
  - Frequency, times of day
  - How can you tell if fish are feeding, if they are overfed, underfed?
  - Methods of feeding: demand feeders, automatic feeders,ad-lib, satiation, percent body weight, etc.
  - The food chain
  - Feeding habits of different fish
  - Anatomy related to feeding

Demonstrations:
- Dissect tilapia, catfish and a carnivorous fish (trout or bass), and compare digestive anatomy and show how fish are adapted to certain feeding habits.
- Formulate a diet using: rice bran, peanut cake, blood meal, and corn, or formulate and actually make a feed out of available foodstuffs.
- Have a variety of samples of feeds (include any feeds available at training site, as well as any others that can be obtained). Compare stability in water (time until pellets break down, time till floating food sinks, etc.), smell, taste, texture, size, etc.

Seminar: Water Quality/Fertilization

Note: Stress to trainees assigned this topic that this can be an intimidating and/or tedious seminar if not well done because of the chemistry involved. Effort should be made to tie the contents of this to practical application as much as possible. The material should be directed toward fish pond managers and should provide them with the information they need to understand the dynamics of a pond well enough to make correct management decisions. Should point out what kind of observations the manager should make, what he/she may see and what he/she should do about it. They should make use of the charts of their own ponds to find examples (use own ponds as case studies), and use as many demonstrations as possible.

I. Water Quality: Basic dynamics of water quality in fish ponds, associated cycles and interactions, what affects levels of various nutrients and chemical components in water, critical levels, etc.:

- pH, alkalinity, carbon dioxide, dissolved oxygen, hardness, nitrate, nitrites, phosphorus, hydrogen sulfide, etc.
- Buffering system, use of lime
- Turbidity
- Predicting low dissolved oxygen (discuss and test some prediction models)
- Effects of overfeeding on water quality
- Stratification
- "Off-flavor"
- Aeration, natural and mechanical forms

II. Fertilization/"Bloom Management"

- Define terms including bloom, crash, inorganic and organic fertilizer
- Limiting factors (what are they (usually), how can you know, what do you do about it?)
- Inorganic fertilizer/Organic fertilizer (characteristics, examples of each, when to use which, how they can be used to complement each other)
- Compare nutrient level of different manures
- Application methods and rates for fertilizer
- Compost
- Monitoring a bloom (using turbidity tests, oxygen readings, other factors)
- Getting a bloom in acidic waters
- Meteorological effects.

Demonstrations:

- Proper use of the Hach kit
- Composting
- Graph DO's and test some of the prediction models they read about
- Solubility of various fertilizers
- Hay infusion
- Before and after water quality tests for liming, fertilization, $CuSO_4$ or $KMnO_4$ (work with Parasite and Disease team)

- To demonstrate buffering: Prepare two samples of the same water. Add lime to one sample. Check pH of both samples. Slowly add drops of sulfuric acid to each sample, check changes in pH to see relative changes between the buffered and unbuffered sample
- To demonstrate relationship between pH and CO2: Add pH indicator to a small bottle of water and note color. Blow into the water through a straw or tube and note color change as pH decreases.

Seminar: Handling/Parasites and Disease/Predators

Note: The theme of this seminar, to be stressed throughout, is the importance of prevention.

I. Handling
- Fish should be handled "as if each is the last of its species"
- Handling fry, foodfish, broodstock
- Counting, weighing and measuring techniques
- Acclimation

II. Classifications of disease organisms that affect fish
- Point out that disease organisms are always present, health and condition of fish determine susceptibility
- For each classification, give several examples of common ones and a representative life cycle to demonstrate why some problems are seasonal or infect fish through different means. Do not go through life cycles of each organism.

III. Other factors that may cause illness in fish (i.e., pollution, nutritional deficiencies

IV. Symptoms and Diagnosis
- Describe both from the very general (indications that all is not right in the pond) to the specific (actual identification of organism)
- What observations should the fish farmer make?
- Which fish should be examined?
- How should fish be examined?
- What are some symptoms generally associated with certain types of disease or parasite problems (although you can only generalize to a point)?

V. Treatment
- Go over common treatments used in fish culture (salt, potassium permanganate, copper sulfate, malachite green, terramycin, acriflavin, furacin, formalin, masoten, etc.)
- Characteristics of these treatments and cautions regarding their use.
- Methods of treatment (dip, bath, pond, treated feed, etc.)
- Calculation of dosages (do several examples)
- Legal aspects of use of chemicals
- Other considerations when deciding about use of chemicals (cost, stress to fish vs. stress of disease itself, etc.)

VI. Transmission of disease and how to prevent it

VII. Predators
- Common predators in fish ponds
- How they get in and what they do
- How to keep them out
- How to get rid of them once they're in

Note: Connections should be drawn wherever appropriate among the three main topics in this seminar.

Demonstrations:

- Dip and pond treatments (show how dosages were calculated, mixing the chemical, assay with test fish, protection of the person applying the chemical, actual application.
- Show how to prepare a slide in order to examine a fish for a parasite or disease organism (where to take sample from fish, i.e., skin scrape, clip fin, etc.).

Seminar: Reproduction/Genetics

I. Reproductive habits of the tilapias
  - Discuss and explain differences between reproductive habits of *Tilapia, Oreochromis,* and *Saratherodon*
  - Make chart for *O. niloticus, O. aureus, O. mossambicus, T. zillii, T. rendalli* and *S. galilaeus* showing fecundity, frequency of spawns, age when spawn, hatch rate, fry survival
  - Management of tilapia ponds for fingerling production

II. Catfish reproduction
  - Management of catfish broodponds and broodstock
  - Broodstock selection
  - Hatchery techniques

III. Carp
  - Pond spawning
  - Induced hormone spawning
  - Broodstock selection
  - Management of carp broodstock

IV. Trout reproduction (optional)
  - Brief overview of techniques used for trout reproduction

V. All species
  - Care of fry

VI. Basic Genetics
  - Define key terms (i.e. DNA, chromosome, gene, allele, gametes, genotype, phenotype, homozygous, heterozygous, dominant, recessive, hybrid vigor, haploid, diploid, triploid, etc.)
  - Basic review of simple Mendelian genetics (sufficient to permit understanding of common aquaculture practices such as genetic selection programs, hybridization, sex reversal, triploidy)
  - Hybridization
  - Sex reversal
  - Triploidy

Demonstrations:
- Teach trainees how to sex tilapia, make sure everyone gets plenty of practice.
- Demonstrate removal of pituitary and injection.

Note: An approach that seems to work well when discussing reproduction in different fish is to go through a continuum for each, first discussing how the fish spawns in nature (environment, requirements, behavior, etc.), then moving on to increasingly intensive levels of management for aquaculture situations. For example, with catfish, first describe how they spawn in the wild including certain temperature requirements, mating behavior, a preference for hollow logs or other territories that can be established and defended by the male, the fanning of the eggs by the male to aerate them, etc. Then describe how a farmer might manage for reproduction: The simplest method is "wild-spawning" or simply stocking males and females and letting the fish spawn in the pond. A slightly more intensive approach would be to provide milk cans or other containers for the males to use as their spawning territories. More intensive still, the farmer can collect the eggs from the cans and bring them indoors to a hatchery where paddle-wheels on the troughs imitate the fanning motion of the male in nature.

Seminar: Harvesting/Transport/Processing/Preservation/Preparation

I. Harvesting
- Stress importance of planning, organization, preparation
- Methods (give several possibilities)
- Discuss how a seine net works (a good way to help illustrate this is by using a seine on the ground as you would in a pond in order to observe what the seine does
- Strategies (partial vs. complete harvest, top-off and restock, etc.)
- Timing (holidays, best market days, population in pond, etc.)
- Use of catch basins, live cars
- Sorting - graders, tables, etc.

II. Transport
- Preparing for transport, stress importance of this (people, delivery point, equipment, vehicle, etc.)
- Preparing fish for transport
- Conditions (time of day, temperature, oxygen, ammonia, etc.)
- Aeration (alternatives to Minnow-savers)
- Use of salt, anesthetics and other chemicals in transports
- Densities for transports (relationship to length of trip, fish, temperature, etc.
- Types of transport containers (tanks, drums, jerry-cans, plastic bags, etc.)
- Transporting fry, fingerlings, foodfish, brooders

III. Processing
- Various methods, techniques, cuts (specify which most appropriate for different species; include tilapia, catfish, carp, trout)
- Dress-out percentages (define, discuss for different species and cuts)
- Health considerations when processing fish
- Shelf-life
- Transport of processed fish

IV. Preservation
- Smoking (hot and cold)
- Salting, drying
- Freezing
- Others

V. Preparation: Demonstrate a variety of ways in which fish can be cooked (can do this at fish fry)

VI. IV. Nets (**Note:** This section may be covered in the Stocking/Sampling/Growth seminar rather than in this one, or responsibility for this information can be shared between the two groups.)
- Parts of a seine, cast net
- Describe different types of nets and their uses
- Describe different types of mesh, how netting is measured, etc.
- Care of nets (treating, sunlight, drying, hanging, etc.)

Demonstrations:

- Work with Stocking/Sampling/Growth team to teach trainees to weave netting. Give assignment for swatch that will fit on a sheet of notebook paper, half inch mesh (this could be done on the field trip) and to hang a seine.
- If possible, actually do one or more transports using plastic bags and/or pick-up truck with tank and aeration. Demonstrate all steps involved and share results with the group.
- Prepare about three plastic bags of fish for transport (use different densities and see how fish fare over time).
- Set up truck with tanks and aerators (even if don't actually do a truck transport).
- Demonstrate use of a grader.
- Demonstrate salting of fish.
- Make a simple smoker and demonstrate smoking fish.
- Serve as coordinators for fish fry. Prepare fish in a variety of ways, including smoking.
- Demonstrate different ways to dress fish (include scaling and gutting, filet, butterfly, others. Try to include skinning catfish and dressing carp.
- For fish fry, have everyone dress some fish.
- Demonstrate how to properly sharpen knives.
- Do a seining demonstration. Include proper preparation and show good, effective techniques from start to finish. (This demo can take place when harvesting fish for the fish fry or marketing).

Note: This is a time consuming seminar because so much of it is presented through demonstrations. Several of the demonstrations can be included during the fish fry preparations if the coordinators are organized. Encourage this team to develop more demonstrations than are listed here.

Seminar: Marketing and Economics

I. Marketing: define basic concepts and terms (include supply and demand, sensitivity analysis, marketing channels, market niche, middle man, etc.)

- Role marketing plays in stocking and harvesting decisions
- Assessing the market, determining market demands (i.e. big fish vs. small fish)
- Marketing strategies
- Setting prices (how? what if too high or too low?)
- Product promotion and sales (advertising, location, time, presentation of product).

II. Economics: define basic concepts and terms

- Diminishing returns
- Economy of scale
- Profit
- Opportunity costs
- Determination of economic feasibility
- Credit and funding sources (finding them, what information farmer needs to provide)
- Accounting for fish farming
  - Define terms (fixed costs, variable costs, operating costs, amortization, depreciation, debit, credit, etc.)
- Assessing economic results
- Maximizing profits

Demonstrations:

- Develop a simple budget and bookkeeping system for a fish farmer.
- Serve as one of coordinators for fish marketing exercise.

Seminar: Levels of Intensity/Complexity/Alternative Management Strategies

Note: For all of the strategies/systems described, discuss advantages/disadvantages, potential problems, appropriateness in various situations, feasibility. Consider needs (real and perceived), availability, ability, resources, infrastructure. Where appropriate, compare growth rates, production figures for various approaches.

Note: This seminar should either begin or conclude with a discussion about the decisions a farmer has to make in terms of his purpose/goal.

Note: Doing the research for this seminar is challenging. **Aquaculture Magazine**, **Catfish Farmer Journal** and other trade magazine and journals are good resources.

I. Intensive/Extensive: define the terms, point out that there is a range from one extreme to the other, they are relative terms.

- Discuss the factors that vary with level of intensity (time, labor, cost, inputs)
- Make it clear that fish culture in developing countries does not have to be extensive; the level of technology may be lower, but fish culture can still be intensive within that framework
- Reasons for choosing a particular level (purpose, goals (fish for food/fish for profit), diminishing returns.

II. Complexity

- Single species crop: mixed sex, no population control
  - stock young, grow out, harvest completely
  - stock mixed sizes, continuous cropping
- Single species crop: mixed sex, with population control
  - use of predator fish
  - monosex
- Polyculture (for two or more crops)
  - use of different niches
  - predator as a second crop

III. Hybrids

- Reasons: for all males, for "specialty fish", others
- Popular hybrids used (i.e., red tilapia, etc.)
  - species crossed
  - success rates
  - maintaining separate broodstock
  - long-term considerations

IV. Integrated Systems

- Rice/fish
  - rotating crops
  - simultaneous
- Pigs/fish
- Poultry/fish

- Other animals/fish
- Fish/gardens
- Integrated farms

V. Multiple pond systems: rotating harvest

VI. Food fish vs. fingerling production

VII. Culture Systems
- Cages
- Raceways
- Hapas
- Pens
- Tanks
- Others

VIII.Stocking densities and methods: for different systems and different markets

Demonstrations:

- Develop good visual aid to illustrate point about continuum between extensive and intensive.
- Use models, posters or other methods to demonstrate some of the apparatus used in various culture systems (i.e., hapas), and to help trainees visualize integrated systems.
- Give the following assignment, to be completed during the field trip:
    - For each of the following cases, develop two appropriate management strategies; the most basic, simple one that will give reasonable results, and one that is more complex. For each, tilapia must be used (though you are not limited to tilapia). Address all aspects of management, all major decisions that the manager must make.
        1. Length of growing season - 12 months
           Market size - 100 g (3.5 oz)
        2. Six months of optimum growing conditions, remaining six months are cool enough to inhibit reproduction and slow growth
           Market size - 250 g (9 oz)
        3. Length of growing season - 12 months
           Market size - any size fish is marketable

Seminar: Pond Ecology and Maintenance

Note: The trainees who have been assigned this topic will be the "narrators" throughout seminar week. They will do an introduction/overview at the beginning, then will introduce each of the other seminars in order to establish the connections among the topics. They should be encouraged to be creative in deciding how to do these introductions. Point out that as the week proceeds, energy levels may fall. Thus, as they prepare the group for each seminar, they should try to boost everyone's enthusiasm for the upcoming topic.

The main part of the Pond Ecology and Maintenance seminar will take place at the end of the week and will be the last presentation (not counting the wrap-up session to be done by the Extension people). This team should stay in close contact with the staff throughout the week.

This seminar is unlike the others in that it is really a synthesis of all of the other topics, rather than its own discrete technical subject. It is very challenging and requires that the team use the other presentations to help them decide exactly what they should cover in theirs. A great deal of creativity and flexibility is required. Since the presentation of this seminar is at the end of the series, it serves as kind of a wrap-up of all of the others.

Some points to include:
- Discuss the various decisions that must be made by a pond manager (i.e., purpose, species, culture system, and many other decisions). This will touch on many of the other seminar topics.
- Address aspects of pond ecology and maintenance that may have been overlooked or not quite fit in with other topics as noted throughout the week.
- Consider all of the factors that affect the productivity of a pond. Work from the general to the specific.
- Do a very large, detailed flow chart showing all of the factors and how they interact. The sizes of the arrows should indicate the importance of each interaction. These should be very complete and creativity is in order. For example, pictures rather than or in addition to words make the chart more interesting.
- Facilitate a discussion of "cookbook" answers. Points that come out of this discussion should include:
  - There really are no set solutions to problems, no magic numbers
  - In fish farming, using your own common sense and problem solving ability is much more useful than trying to blindly plug someone else's formulas or solutions into your situation if you don't fully understand those formulas or solutions. There should be several examples they can use here from training.
  - To a large extent, fish culture is still more of an art than a science.
- Discuss types of records a pond manager should keep, possible formats.

Demonstration:
- This seminar should conclude with a "Pond Walk". Lead trainees on a walk around the training ponds. Discuss observations, compare different management practices and the results of those practices. Point out how much can be determined about what is going

on in a pond and how it is being managed by careful observation with a "trained eye". For the Pond Walk, it works out best logistically if the group is split into two smaller groups. One team member from this seminar leads each group and facilitates the discussions.

- The "Big Board". This should actually be set up as early as possible, preferably as soon as seminar preparation begins. This team should devise a large wall chart or similar system in which every trainee has the responsibility of filling in information about his/her own pond. The purpose is so that trainees can compare the results of their own management techniques with others. Information on this chart should include (for each trainee's pond): stocking rates, species stocked, type of feed used, feeding rates, type and amounts of fertilizer applied, sampling technique, growth rates, FCR, dissolved oxygen fluctuations, secchi disk readings, pH, an other information the trainees think will be helpful.

Session VI-2: Pond Interview - Week Six

Time frame: Approximately fifteen minutes per trainee

Note: Please refer to Pond Interview - Week Four in Chapter Thirteen for objectives, overview, procedures and trainer notes. Everything remains the same in this pond interview except the questions. Examples of the questions asked in this pond interview include:

1. What are you feeding your fish? What percentage of their weight are you feeding them? How are you determining how much to feed?
2. When was your last sample?
3. What was your sampling technique, sample size?
4. What did you learn from that sample? (growth rate, FCR, health/condition of fish, etc.)
5. Based on your sampling information, is your feeding program proving cost-effective?
6. As a result of your last sample, did you make any adjustments in your management? What and why?
7. Have your fish reproduced? If so, what adjustments have you made to your management and data collection as a result?
8. How are you managing your plankton bloom?
9. What stands out right now as the most burning question you have regarding your pond, and what are you doing to answer that question?

Session VI-3: Trainee Evaluation of Program - Week Six

Note: For objectives, overview and trainer notes regarding procedures, please see "Trainee Evaluation of Training: Week Two" in Chapter Eleven. The procedure is exactly the same each time, and the form is the same except for the activities that are listed. The actual content of the forms will depend upon exactly what activities have occurred. A sample form follows:

Name (optional) ______________________________

On a scale from 1 to 5, rate the value of the following activities (0 = not at all valuable, 5 = extremely valuable). Please make comments or give suggestions for improvement.

Guest Expert (Name): Site Selection/Pond Design/Pond Construction

Site Development Exercise

Masonry Project

Guest Expert (Name): Programming Issues in Peace Corps Aquaculture Programs

Fish Fry

Visit to library or other facility/Access to experts as part of seminar preparation

Management of your own pond

2. How satisfied are you with your progress since your arrival in South Carolina ? (very dissatisfied, dissatisfied, satisfied, very satisfied)

3. If you are not "very satisfied" with your progress, what factors are related to your own performance?

4. What factors are related to the training activities, resources, and/or staff?

Please rate the following aspects of the program that are not related to actual technical training. (Unsatisfactory, Fair, Good, Very good). Again, please make comments or give suggestions for improvement.

Housing

Breakfast

Lunch

Supper

Transportation

Medical Care

Additional Comments:

CHAPTER SIXTEEN

PROGRAM DESIGN - WEEK SEVEN

Note: Week Seven is comprised entirely of seminar presentations. See Chapter Fourteen for notes on seminar presentations and material covered in each seminar. The only other activity (other than normal pond management) is the meeting regarding the field trip. The design for that meeting is included in this chapter.

Session VII-1: Meeting - Preparation for Field Trip

Total time: 1 hour, 5 minutes

Objectives:

- Prepare trainees to make the best use of the trip;
- Inform trainees of itinerary, logistics,trainee and staff roles, and rules.

Overview: This meeting takes place after seminars have been completed. Although trainees should already have been informed that they would be going on a one-week field trip, they have not yet heard any details or had the opportunity to really focus on the trip. In this meeting, they have their first chance to actually discuss the purpose of the trip and how they can gain the most from it. In addition, they will be informed about the logistics and of the roles and responsibilities that they and each of the staff members will have during the trip.

10 minutes

1. The Master Trainer reviews all training activities in which the trainees have participated up to the present, culminating with the completion of a set of very intense, in- depth seminar presentations on a diversity of aquaculture topics. Remind trainees that they have also gotten some actual fish culture experience, further enhancing their knowledge and their understanding of how that knowledge applies in practice. Acknowledge the tremendous progress and the significant accomplishments the trainees have made during the past seven weeks, and allow them to enjoy a moment of recognition of their own achievements.

Ask the trainees to comment on the difference between them going on this trip now, versus how it would have been if they had gone on the trip during the first week or two of the program. How are they different? What is different about how they will use the opportunities the trip will present?

Point out that throughout this trip, they will be interacting with professionals in the aquaculture industry as professionals themselves, and that this will be an excellent opportunity for them to continue to develop the professional self-image with which they have begun to get accustomed.

20 minutes

2. The Master Trainer leads a group discussion of the following:
   - Purpose of the trip:
     - Why are you going?
     - How does it relate to your work as a volunteer? (Add to expertise, knowledge and credibility, learn what is in actual practice, get a perspective on a developed aquaculture industry, etc.)
   - Ways of gaining the most from the field trip (Do not let information pass by, be attentive, get enough sleep,review and organize notes, discuss information gained at each stop, identify all resources and don't overlook resources who are not immediately obvious, get credentials, learn goals of facilities or resource people, etc.)
   - Methods of gathering information (take copious notes, organize notes, be assertive in asking questions, be observant, listen carefully)
   - Making the best use of the information
     - Assessing and assimilating information (process information for future use, assess accuracy and point of view of the source, compare information on similar topics in light of the sources, apply new information when possible upon return).

5 minutes

3. The Master Trainer points out that the trip is a nice break from the normal routine, offers some time away from the training site, and is generally very enjoyable, but it is a very serious and valuable aspect of training and should be taken full advantage of as a learning opportunity. It is not really a vacation, but it is a good opportunity to get recharged. Upon return from the trip, the pace of the program will continue to be hectic and difficult. Trainees should be cautious regarding the possible temptation to "play" too hard. They should use the trip to catch up on rest that was probably missed during the last couple of weeks, refresh their energy ,and get mentally and physically prepared for the last few weeks of training upon their return.

The Master Trainer also reminds the trainees that they will be expected to promote a positive image of Peace Corps among the people they meet. The trainees are informed of any specific dress codes or other rules regarding behavior or appearance.

20 minutes

4. The trainer who is in charge of the field trip distributes the itinerary and covers the following points:
   - Overview of itinerary
   - Van assignments and rules regarding travelling in and maintaining vehicles
   - Luggage limits and suggestions for packing
   - Schedules and importance of timeliness
   - Driver responsibilities
   - Announce who will be trainee drivers
   - Hotel rooming lists
   - Rules regarding hotels
   - Meals (logistics, rules)

- Responsibilities of trainee facilitators at each stop
- Staff roles
- Appropriate dress.

5 minutes
4. Trainees are given the following assignment to be handed in at the end of the trip: For each stop, state what you think the goals are for the facility, and list the ways in which they try to achieve those goals. Brainstorm a list of ways in which they could improve their management.

In addition, the trainees are reminded of the other assignments that will be due at the end of the trip (these were assigned as part of seminars), A) a net swatch of approximately 8" by 11" is to be woven with a 1/2" bar mesh, and B) there is an assignment that was given by the Levels of Intensity seminar in which trainees have to develop certain management strategies.

Thus, upon return from the trip, three assignments are due.

5 minutes
6. Trainees are reminded of any work that must be turned in prior to leaving on the trip. This includes any outstanding weekly reports, monk form design, and instructions for feeding each trainee's fish while the group is away. Trainees are given an opportunity to ask any questions they may still have.

Resources and Materials:

- Copy of trip itinerary for each trainee.

Trainer Notes:

- In the past, this session was longer and included some small group work. However, this session usually occurs immediately following the last seminar presentation after a very long, difficult week, often late in the day just prior to the day of departure for the trip. Trainees are generally very tired and some may be emotionally drained. It is hoped that this meeting will provide a sense of closure to the week, acknowledgement of a tremendous effort, an opportunity to savor a sense of accomplishment, and a sense of excitement and enthusiasm for the trip that is to come. Thus, it was determined through a series of modifications that this meeting should be kept as short as possible and make few demands on the trainees.
- Completion of seminars is an important landmark in training. The staff members themselves should keep this in mind so that they can extend their sense of respect for what the trainees have accomplished to the trainees through their own attitude and demeanor.
- The details to be covered by the trainer in charge of the trip will obviously vary for each situation. The following is a sample of the kinds of information provided during step four (above) for the trips in this program:

- Travel:
  - Three vans and pick-up truck. Number of people per van.
  - Three trainee drivers (names). They will work with Trainer X on vehicles. Only they are authorized to do so. Their responsibilities include driving maintenance, care and being sure vehicles are kept clean. The entire group is expected to help keep the vehicles clean.
  - Driving is a tremendous responsibility and is very stressful. When not driving, drivers need to rest. They have first choice for comfortable seats. Please be cooperative and considerate of the drivers.
  - There will be long stretches spent in close quarters in the vehicles.Please be aware that it will be easy to get grouchy. Be considerate regarding space, volume of tape players, moodiness, etc.

- Schedules:
  - It is critical that the group be on time for all stops. Our hosts are taking time out of very busy schedules to meet with us. The itinerary is very carefully laid out and the arrival time for each stop is dependent upon the departure time from the previous stop, so problems can snowball if we get off schedule.

- Lodging:
  - Roommates are generally the same as at the training site. Sharing double beds may be necessary at some stops.
  - You are responsible for any extra charges at motels, such as phone calls or movies.
  - Trainer Y will hand out keys and assign rooms at each motel. You are responsible for returning the keys in the morning.
  - Lodging facilities on the trip are considered the training site, and the same rules apply regarding absences from the site. Written authorization will be required.
  - Some motels have swimming pools, so pack swimsuits if desired.

- Meals:
  - Breakfast will usually be eaten at the motels.
  - Lunches will usually be sack lunches from the motels.
  - Dinners will be either at the motels or at other restaurants.
  - In most cases, the meal orders are previously arranged. Unless given specific permission to do so, please do not order anything special or extra.

- Trainee Facilitators: Three facilitators will be assigned for each stop. Duties include:
  - Receive briefing evening prior to visit by specified trainer.
  - Ride in separate vans before and after each stop. Brief your van about the upcoming visit, then facilitate a debriefing after each visit to discuss what was seen and learned and to share information that may have been missed by some people
  - Serve as the navigator in your van for the trip to your designated stop

  - The first facilitator committee of the day is responsible for making sure vehicles are loaded, and everyone is on board on time
  - The first facilitator committee of the day works with the trainer in charge of meals to be sure lunches for that day are loaded in vehicles
  - Responsible for getting people in and out of vans on time at your stop
  - Meet and greet people at stops, get credentials, names, addresses, and make introductions
  - If appropriate, divide the group at the stop (for example, if there is more than one resource person they may prefer to split the group and give separate tours)
  - Bring things to a close, thank hosts, locate rest room facilities and allow time for group to use them, get vans loaded and be sure group departs on time
  - Write thank you letter for your stop. Submit hand-written draft to specified trainer the day after your stop.

- Staff roles:
  - Trainers are available for support, advice and logistics, but this is your trip. The trainers will have a lot to do and will have a lot on their minds.
  - Each staff member has certain main responsibilities during the trip. If you need something, have a problem or need to notify a trainer of a problem or concern, please address the appropriate person whenever possible.
  - Give breakdown of staff responsibilities, for example:
    Trainer A: Trip Coordinator (Logistics/Directions/Money)
    Trainer B: Meals and Supplies
    Trainer X: Vehicles
    Trainer Y: Lodging, Briefings and Thank-You notes.

CHAPTER SEVENTEEN

PROGRAM DESIGN - WEEK EIGHT

Field Trip

Objectives:

- Provide overview of aquaculture industry in the United States including many of the various aspects of the industry;
- Provide trainees with a new perspective regarding the potential of aquaculture as an industry to increase their own sense of conviction and enthusiasm;
- Provide opportunity to reinforce and see practical application of the knowledge and concepts trainees have learned in training;
- Familiarize trainees with concerns and actual daily activities of farmers and others in the industry;
- Provide opportunity for trainees to interact at a professional level with others in the industry.

Overview: The field trip is usually six to seven days long and takes place following the seminar presentations. Trainees travel as a group to visit a wide variety of facilities and businesses that comprise the various aspects of the aquaculture industry. The trip is extremely valuable on many levels, serving to reinforce and supplement technical knowledge, provide new perspectives, dramatically increase enthusiasm and instill a sense of pride in the trainees related to feeling a part of what, for most, is a new and exciting field. In addition, the trip provides a break in the hectic routine of training at a point in the program when the trainees are usually tired, and allows trainees to catch up on some rest, rejuvenate and prepare themselves for the last two weeks of training. This chapter does not describe any session designs, but is a set of notes for the training staff regarding the preparation, planning and implementation of the field trip.

Trainer Notes:

- One trainer is designated the Field Trip Coordinator and has overall responsibility for all aspects of the field trip. This is a very difficult and stressful job. The Master Trainer and the other staff members should keep that in mind and be sensitive, cooperative and supportive throughout the preparation of the trip, during the trip, and immediately after the trip.

Planning and Preparation:

- The Coordinator should begin making preparations as early in the program as possible. If the program is being conducted at a new training site, a great deal of research should already have been done prior to the beginning of the program to identify possible resources, facilities and businesses that may be visited on the field trip and to make contact with as many of the people as possible. The Coordinator should familiarize him/herself with the names of contact people at each potential stop, and should learn about the goals and practices at each facility. He/she should begin trying to make the appointments and work out the route as early as the second or third week of training.

- It can be difficult to set up the itinerary since so many people are involved, each with his or her own busy schedule. The Coordinator must become very familiar with the routes and be prepared to juggle stops as necessary to be able to make arrangements that will fit into everyone's schedule and work out logistically.
- Once appointments have been made, each should be confirmed by letter, and then reconfirmed by phone (and letter, if possible) closer to the time of the trip. Be sure to get extremely good, thorough directions including details on mileage if at all possible and landmarks to watch for, especially in rural areas.
- For arranging lodging and meals, be sure to learn about all administrative procedures related to billing, payment and the arrangements that are to be made regarding all aspects of the trip involving money. (Lodging, meals, gas, emergency repairs, entrance or admission fees, parking, unforeseen supply purchases, and medical emergencies). This part of the preparation should be done in conjunction with the training site administrator(s).
- Establish contact with specific people at each motel,restaurant or other support facility. For lodging, tell people at the motels and send a written copy of prices agreed upon, procedures for payment, all rooming lists, exact numbers of people and rooms, etc. For meals, arrange all menus ahead of time and make all other necessary arrangements for special considerations such as provision of sack lunches, meals that need to be served outside of normal hours, and filling of coolers with ice and/or drinks, in addition to getting clear agreements on prices. Again, confirm by phone and by letter.
- Calculate all mileage. Write a complete itinerary that includes directions between every stop (including lodging and meal facilities), exact mileage, amount of driving time between each stop, arrival and departure times.
- Determine how many vehicles will be necessary for the trip. Keep in mind that a good deal of time will be spent on the road so it helps if vehicles don't have to be full to capacity. Also remember you will be carrying people and their luggage, plus coolers with lunches and other supplies.
- Calculate amount of money that will need to be carried for lodging, meals, gas (base on mileage, be very generous in your estimates), emergencies and other possible unforeseen expenses.
- Make all necessary arrangements to get Traveler's Checks(or whatever form of money is to be carried). Devise an efficient system for keeping extremely accurate records of all expenses and keeping all receipts in order. You will be accountable for this money.
- Determine all responsibilities that need to be shared by the staff and figure out the best way to divide them among the staff members. Get input on this from the Master Trainer and from the trainers, but you make the final decisions regarding how the work will be divided.
- There will probably need to be several staff meetings regarding the trip, but it is imperative that you call and facilitate a lengthy, formal staff meeting to discuss the itinerary in detail, as well as each trainer's specific roles and responsibilities for the trip. Other issues to be covered in staff meetings before the trip include deciding which trainees should be asked to help drive, assigning trainee facilitators for each stop, and discussing how behavioral data will be collected on the trip.

Roles and Responsibilities:
Note: Individual roles for trainers is broken down according to what makes the most sense in terms of numbers of staff and trainees, skills and experience of staff members (for example, some may be repeat trainers who are already familiar with the stops and know the resource people, some have better organizational skills, etc.), the normal supplemental training duties already designated, fairest division of the work load and personal preference. The following breakdown is an example of how responsibilities were divided for some of the field trips in this program, in this case assuming a staff of four trainers (Master Trainer did not go on the trip).

- **Trip Coordinator:** If circumstances are such that there is a repeat trainer or that one of the trainers is especially familiar with the fish culture industry in the surrounding areas, these would be helpful in determining which trainer should be in this position. In addition, this position requires someone with excellent organizational, leadership and interpersonal skills who can work well under pressure. Duties include:
    - All preparations listed above.
    - Facilitating staff meetings as necessary in preparation for the trip and during the trip.
    - Serves as the main contact person at all stops. All resource people and hosts will know this person's name and he/she should be the first person they meet from the group.
    - Introduce trainee facilitators to hosts/resource people at each stop.
    - Makes any necessary announcements about changes in the itinerary.
    - Handles all cash transactions (meals, lodging, gas, any other expenses). Must retain all receipts and be accountable for all money spent.
    - Duties are shared by the staff, and in general, decisions that fall under another trainer's job responsibilities should be made by that trainer. However, if a decision must be made about something that does not clearly fall into someone else's role, or if the staff cannot reach an agreement about something, the Coordinator has the final word in making decisions.
    - Maintains contact throughout the trip with the Master Trainer and/or site administrator who remains at the training site.
    - Attend all briefing meetings (in some cases, this trainer will be the most appropriate person to do the briefings).
    - Usually, this trainer should be in the lead vehicle unless another trainer is more familiar with the directions.
    - Upon return from trip, write thank you note on behalf of staff to each resource person, host.

- **Assessment, Meals and Supplies:** Duties include:
    - Devise system for collection and organization of behavioral data during the trip. This can be difficult at the stops.
    - Notify other trainers when behavioral data is not being collected for certain individuals.
    - Be responsible for notifying the Master Trainer of any unusual, extreme or otherwise significant behaviors that occur during the trip.

  - Be aware of exactly what was agreed upon regarding all meals and ensure that exactly what was agreed upon is delivered, and that they are delivered at the specified times. (Menus, sack lunches, drinks and ice, plastic utensils, napkins, and condiments).
  - Upon arrival at any facility at or from which a meal is to be provided, make contact with the appropriate personnel.
  - Remind meal personnel at motels about sack lunches to be prepared for the following day. Be sure that lunches are loaded onto the vehicles. If coolers are to be refilled, be sure they are cleaned and given to the mealpersonnel in time to fill.
  - Make sure all necessary supplies are loaded prior to trip and distribute them as necessary. A suggested supply list includes:
    - Notebook paper
    - Notebook dividers
    - Pens
    - Pencils
    - Markers
    - Trainer Notepads
    - Garbage bags
    - Ziploc baggies
    - Insect repellent
    - Tylenol and/or aspirin
    - First aid supplies
    - Sponges
    - Paper plates
    - Knives/forks/spoons
    - Duct tape
    - Electrical tape
    - Toilet paper
    - Tissues
    - Paper towels
    - Dish-washing liquid
    - All-purpose cleaner
    - Scotch tape
    - Stapler and staples
    - Scissors
    - Post-it notes
    - Index cards
    - Hole punch
    - Masking tape
    - Twine (for net-making assignment)
    - Flashlights
    - Coolers
    - Maps

- **Lodging, Briefings, Thank-You Notes:** The job of giving briefings to the trainees is best given to a trainer who has been on the trip before or who has the most familiarity with the various facilities and resource people, if possible. In this case, we are assuming the person in charge of lodging is also an appropriate person for briefings, but jobs can be rearranged as discussed above. Duties include:
  - Reconfirm reservations for each evening during the early afternoon of that day. Reconfirm arrival times and meal times, and notify motel and/or meal staff of any changes in schedule (e.g. late arrival).
  - Upon arrival at the motel, accompany the Coordinator to the registrationdesk, provide rooming list, pick up keys.Distribute keys to trainees, and make sure trainees understand the room assignments.
  - Notify trainees of any special rules, regulations,recreation facilities, etc.as appropriate at motels.
  - Each evening, meet with trainee facilitators for following day's stops (separately by stop). Tell the trainees the names of the contact people, and brief them about the facility including special points of interest, suggestions for appropriate types of questions, and time frames. Also, go over the directions with them so they can navigate to the stop.

    - Collect thank you notes from trainee facilitators. Be responsible for making sure these are typed, reviewed by the trainees and mailed upon return to the training site.

- **Vehicles:** The trainer who normally has responsibility for vehicles is the logical choice for continuing this role during the field trip. Duties include:
    - Works closely with trainee drivers. Meets with them frequently, monitors their driving habits, etc.
    - Meets with trainee drivers prior to trip to ask them if they are willing to drive, describe their responsibilities in detail, and take them for practice drives in the vehicles.
    - Responsible for all vehicle maintenance (trainee drivers help with this). Includes thorough check-over of all vehicles prior to trip as well as upkeep during trip, being sure all vehicles are fueled each evening, oil checked, tires checked, windshields cleaned, etc.
    - Make sure each vehicle is supplied with important items such as basic tools, flashlight, first-aid kits, and maps.
    - Deal with any vehicle breakdowns.
    - Attend briefings meetings whenever possible, and review directions with trainee drivers. Preferably do this each evening for the following day's trip,otherwise first thing in the morning.
    - If the group is large, you may choose to assign certain trainees to certain vehicles. In any case, set up some system for making sure everyone is always accounted for no one is ever left behind at a stop.
    - Either set up rotation system for trainee (and staff) drivers, or assign each one to a specific vehicle. All drivers should know exactly which vehicle they will be driving on any day.

- Additional notes regarding vehicles:
    - Trainee driver selection: Trainee drivers should be carefully selected by the staff. If at all possible, only trainees on whom the staff agree unanimously should be selected. They should have good driving records, and must be mature and responsible individuals. Be sure not to confuse issues regarding the kinds of characteristics that need to be assessed in making this decision. For example, the strongest trainee in terms of technical competence is not automatically also the most responsible as a driver. Be sure to consider all aspects of the trainees' demonstrated behavior, maturity and level of responsibility in various situations. In some cases, there are trainees who have experience driving in a professional capacity such as school bus drivers, delivery people, or truck drivers, so be sure to pay attention to details of the trainees' experiences prior to joining Peace Corps. Once chosen, trainees should be asked, not ordered, to serve as drivers. Some may prefer not to bear that responsibility. Be well informed about insurance policies, liability and similar issues.
    - Guidelines for trainee drivers: (These should be explained in detail by the trainer in charge of vehicles during a meeting held prior to the trip).

  - You have the most difficult and important job of anyone on this trip. Keep in mind the responsibility you have for many other lives, that vehicles may be unfamiliar to you, and drive extra carefully. You must be in excellent condition whenever you get behind the wheel.
  - Do not drink (alcohol) at all during the day. It is suggested that you do not drink in the evenings, but if you choose to do so, do it early in the evening (after completing any maintenance activities such as going to get gas) and in moderation.
  - Get plenty of rest. Go to bed early.
  - Be sure to share your driving with a trainer. Be honest and smart about asking for a break when you need one (or even if you don't think you need one but you have been driving for a long time).
  - Try to sleep or relax when not driving. Choose a comfortable seat. Do not serve as a navigator when taking a break from driving (facilitators will do that).
  - On the day that you are to serve as a trainee facilitator, you will not drive to or from that stop so that you can carry out the duties associated with that role.
  - If CB's are to be used in the vehicles (these are recommended), remember that the CB's are not toys. Use them only as necessary, not for chatting or joking. All CB's are to be kept on the designated channel at all times.
  - Keep headlights on at all times so vehicles can keep track of one another. Use flashers to signal a problem if the CB doesn't work.
  - Always follow the lead vehicle and always move as a group. No vehicle should take a different route because they think they know a shortcut or because they think an error has been made. In the latter situation, try to contact the other drivers through the CB or some flasher signals agreed upon in advance, all vehicles pull over and drivers discuss the problem.
  - Do not exceed speed limits.
- Note: All rules and regulations for trainee drivers apply to staff drivers as well.
- Vehicle Breakdowns: The first rule here is, make sure you don't have any. If that rule gets broken, then make sure you have a set of guidelines to follow in case of a breakdown, and be sure everyone knows what they are. For example:
  - If a vehicle breaks down, get it off the road as quickly and completely as possible.
  - All other vehicles should stop at or return to the broken vehicle and pull off the road. If the problem cannot be solved in time to meet the itinerary, try to load all trainees into remaining vehicles (if it can be done safely and legally), or arrange a shuttle and proceed to the next stop leaving the trainer in charge of vehicles and one other trainer (preferably with a vehicle) with the disabled vehicle.
  - If being late for the next stop or a staggered arrival is inevitable, notify the people at that stop as soon as possible.

    - The trainers who stay behind will need to do whatever is necessary to get the vehicle repaired. This may involve fixing it themselves, getting towed to a service station or getting road service. Be sure everyone knows in advance how payments for these situations should be handled.
    - The trainers who remained will have to use their best judgement to determine what to do once things have been put into motion to get the vehicle repaired. One may rejoin the group while the other waits, or they may both need to wait. Try to rejoin the group as soon as possible.

- **Itinerary:**
  - Each trainee and staff member should receive an itinerary that contains the following information:
    - For each day:
      - Date
      - Arrival and departure times
      - Names of facilities, contact people (with titles) at each facility, telephone number of each facility
      - Trainee facilitators assigned to each stop
      - Name of motels and restaurants, telephone numbers,contact people
      - Directions and mileage to each facility, motel and restaurant (optional: photocopied portions of maps)
    - Additional information:
      - Rooming lists
      - Van assignments (if appropriate)
  - Staff copies of itineraries may include additional information such as menus, highlights of stops, description of roles and responsibilities, guidelines for vehicle use and breakdowns.
  - In putting together the trip itinerary, try to include a diversity of stops that will provide an overview of the aquaculture industry. Suggestions regarding the kinds of facilities and/or resource people that should be incorporated, if possible, include:
    - Large commercial production facilities
    - Small, private production facilities
    - Government production facilities
    - Production facilities that operate at different levels of technology (simple and high-tech)
    - Research facilities (university, government)
    - Both hatcheries and food fish production facilities
    - Fish-out operation
    - Fish restaurant
    - Fish market
    - Extension facilities, extension agents
    - Spokes person for organized farmer group
    - Transporter (Live hauler)
    - Feed Mill

    - Processing plant
    - Parasite and disease diagnostician
    - Equipment supplier (assorted aquaculture supplies, net making factory, transport box manufacturer, etc.).

- Since a field trip will have to be developed for any specific training site, a complete sample itinerary will not be provided here.

CHAPTER EIGHTEEN

PROGRAM DESIGN - WEEK NINE

Session IX-1: Field Trip Debriefing/Reentry to Training

Total time: *1 hour, 40 minutes*
Part A: 45 minutes
Break: 10 minutes
Part B: 45 minutes

Objectives:

- Share some general impressions and discuss common themes noted on field trip;
- Encourage trainees to think of what they learned and experienced on the trip in relation to their job overseas;
- Bring closure to the field trip;
- Prepare trainees for the remaining weeks of training.

Overview: This is the first meeting to take place upon return to the training site after the field trip. The first part of it is spent discussing the trip. The trainees already discussed each stop among themselves throughout the trip and had an opportunity to fill in their notes by sharing and comparing what they heard and learned, so details about each stop are not the focus of this meeting. Instead, this serves as an opportunity to discuss from a more general perspective, to think about how what was learned can be applied to their own work, and to reflect on the job they will be doing as volunteers in light of what they have seen and learned on the trip. This meeting brings closure to the field trip, and the second part of the meeting is intended to help the trainees get refocused on what they need to do during the remaining weeks of the program.

Part A

1. Upon arriving at the training site, trainees should hand in their three assignments: the net swatch, the Levels of Intensity management strategies assignment, and the assignment regarding each of the field trip stops.

30 minutes

2. The Master Trainer welcomes everyone back and asks people to comment on the trip. He/she facilitates a group discussion about the trip. The following are suggested questions that may be posed to encourage discussion:

- What were some general themes common to several of the stops regarding the technical aspects of fish culture?
- What did you learn that you plan to apply directly to your own pond work?
- You saw aquaculture extension from many different viewpoints. Describe the flow of information and ideas, and the processes used among all of the people involved.
- What stop or person made the greatest impression on you and why?

- Did anyone discover that they had any misconceptions, biases or tendency to stereotype that they weren't fully aware of before (for example, people often have misconceptions about farmers if they are not accustomed to interacting with them)?
- How did you feel and/or what did you observe about yourself while interacting with the many experts and resource people you met on the trip?
- Additional observations, comments?

10 minutes
3. The Master Trainer asks the trainees to take ten minutes to respond to the following question in writing. This is collected, to be returned later.
   - How have your expectations and feelings about your own job as a fish culture extensionist changed or been reinforced as a result of this trip?

5 minutes
4. The Master Trainer assigns the following question to be answered and handed in two days:
   - Having completed seminars and the field trip, you should have some new perspectives on your own fish and ponds. What things do you see differently, what would you do differently now if you were to start over?

The Master Trainer suggests that trainees put all of the information they collected from seminars and the field trip into order in their notebooks so that the information will be accessible and useful in the future.

The Master Trainer asks if anyone has any additional comments about the trip, then thanks the trainee drivers. It is announced that this is the end of the discussion about the field trip, and that there will be a ten minute break. When the group reconvenes, we will discuss the schedule and activities for remainder of the program.

10 minutes
Break.

Part B
10 minutes
1. The Master Trainer asks the trainees to list everything they can think of that will need to be done during the remaining two weeks of training. As the trainees respond, a trainer records the list on the board or on newsprint. When the trainees have listed all they can think of, the Master Trainer can supplement their list with items they have overlooked or of which they were not aware. An example of the items that should appear on the list (list will vary to some extent with each program):
   - Pond Construction
   - Seine Hanging instructions (if not already covered during seminars)
   - Seining Demonstration
   - Any required supplements to seminars
   - Site Selection/Pond Design project (*)
   - Fish Fry
   - Fish Marketing

- Wheelbarrow and/or Masonry Project (if not already completed)
- Meetings with visitors (for country specific information) (*)
- Trainer Slides (*)
- Trainer Panels (*)
- Meetings on Male and Female Volunteer Issues (*)
- Meeting on Culture Shock (*)
- Two special technical meetings (*)
- Wrap-Up Meeting on Construction Project
- Final Harvests
- Final Reports
- Final Interviews
- Clean-up
- Shopping and Packing.

Items with an (*) are ones that trainees will probably not be aware of.

20 minutes
2. The Master Trainer explains some of the points with which the trainees are not familiar, as appropriate. When explaining trainer panels, the trainees are informed of the format, and of what topics will be covered in the first one. Regarding visitors, the trainees are informed about the names of the people who will be visiting, with what country each one is associated, and any other important information regarding each. Some points, such as the site selection project, are not discussed in detail at this time but are briefly explained so trainees understand the time frames in which they will occur. No explanation is given about the special technical meetings other than time frames. Regarding final reports the Master Trainer makes these points:

- They are extremely important. You will not be admitted to a final interview until your final report has been accepted. You will not complete the program until you complete your final interview.
- Final reports are due two days to the nearest half-day after you complete your final harvest.
- You will receive information regarding the required format for the final report tomorrow.
- It is not necessary to wait until your final harvest to begin writing the report. This will be a major project and waiting until the last minute would be a big mistake. Also, if everyone waits until the last minute the trainers will not be able to get through all of them in time and the entire final interview schedule will be delayed.

10 minutes
3. A tentative daily schedule is presented for the remaining weeks, but the Master Trainer points out that the schedule is likely to be modified several times, and that some aspects, such as blocks of time used for construction and other trainee directed projects will be determined by the trainees themselves.

The Master Trainer makes it clear that for the remainder of training the trainees will have more control over how their time is used and will be kept well informed about activities and meetings. The trainees are told where the schedule will be posted, and where any changes will be posted as they arise. It is the trainees' responsibility to make sure they refer to the postings frequently to stay in touch with what will be a full and probably very dynamic schedule. With so many activities underway simultaneously, it will be important to have very short daily meetings just to keep both staff and trainees up to date. Trainees in charge of projects will also need to schedule meetings. They should also post these notices and make announcements at the meetings, and they should clear their plans through the appropriate staff members first.

5 minutes
4. Staff members make all necessary announcements including the day's schedule. Appointments are made to meet with individual trainees as necessary. Many of the trainee coordinators for the different projects will need to work on them and will require input and assistance. The trainees who will be facilitating the special technical sessions need to be notified of their responsibilities and receive input.

Country specific information is distributed to the trainees.

Resources and Materials:

- Names of all scheduled visitors, dates of their arrival and departure, countries in which they serve(d) or work(ed).
- Copies of any information about the countries to which the trainees are assigned and/or the aquaculture programs in those countries as provided by Peace Corps/Washington or field staff (Enough copies for all trainees to receive the appropriate material. If some documents are very thick, a few copies can be shared by the trainees, and individual copies can be provided upon request.)
- Prepared newsprint of proposed schedules for remaining weeks. Have some blocks filled in with items that the staff needs to schedule, but if preferred, leave the flexible blocks blank and fill them in at the meeting with the trainees input.
- Blank newsprint, markers, masking tape
- Blackboard, chalk, eraser.

Trainer Notes:

- The mood of this meeting should be very upbeat and energetic. Trainees are usually inspired and excited what they saw on the field trip, and the facilitator should try to draw out that enthusiasm during Part A. During Part B, continue to draw on and project that positive energy. The point here is that trainees are in a new phase of training. They are much more knowledgeable and experienced than they were during the earlier part of the program, and they will have a lot more control and responsibility from now on. Since they now more fully understand the value of what they are learning and the effectiveness of learning it in sometimes difficult ways, they can be expected to appreciate rather than dread the busy weeks that lie ahead. Many will be feeling a much more real and focused sense of responsibility regarding their own preparedness to do their jobs since they have seen people doing similar jobs in "the real world" and since their departure time suddenly seems very close. They should be looking forward to the remainder of training with a sense of energy and determination. They should have become more relaxed with the staff during the field trip, and they should sense from the tone of this session and from the attitude of the staff that everyone will be working as a team in order to get through the many activities that have to covered during this last part of training. They should realize that although they have responsibility for their own training, the staff is there to help them, respect them and support them as allies and proponents.

- Having said what is said during this session, the staff must stand by it. Keep trainees informed as changes become necessary or as new issues develop. During the meeting, acknowledge items that you are not explaining in detail so trainees are assured that they will learn about these items at the appropriate time. Allow trainees to have as much say as possible in designing the schedule, given certain blocks that must be set aside for structured activities such as the site selection project.
- The weeks that remain after the field trip are extremely busy and hectic. The staff must be mentally and physically prepared, each staff member's roles and responsibilities must be very clearly defined and the staff should be as helpful and supportive as possible while also giving trainees as much control as is reasonable.
- **Important:** Prior to this meeting, the staff should have a similar meeting among themselves to discuss the field trip and the remaining weeks. The trainers should fill in the master trainer on what occurred during the trip, special points that should be brought up when discussing the trip with the trainees, and any important information regarding individual trainees that needs to be addressed immediately or at the next interview. The Master Trainer should bring the trainers up to date on exactly what will be going on during the last weeks. As with the trainees, any activities that are not familiar to the staff members should be explained. Each trainer should be certain of his/her role this is a period when several of the projects will have a particular trainer assigned to coordinate and/or provide support. Some time should be spent discussing the hectic pace of the remaining weeks, the pressure the trainees will be under, and the kind of atmosphere and attitude that needs to be maintained by the staff in order to provide the most supportive environment.
- Trainers, especially the Field Trip Coordinator, are often very tired upon their return from the trip, so if at all possible, they should be given opportunities to take off half-day blocks the week after they return.

Session IX-2: Site Selection/Pond Design

Total Time: 15 hours, 20 minutes

Objectives:

- Provide additional experience in site selection and designing a viable pond;
- Give trainees an opportunity to be certain that they are comfortable with these skills as well as to identify and improve aspects that are still confusing, thus enhancing their self-confidence;
- Practice extension techniques and receive feedback on their effectiveness in communicating technical information.

Overview: This is the second project in site selection and pond design. This exercise takes place near the end of the program, after trainees have seen a variety of pond types on the field trip. Since this is often an area of concern for the trainees (an area in which they lack confidence), the more practice they can get with it the better, especially as the time for their departure overseas approaches. Some differences between this project and the first Site Development exercise are that the trainees work in pairs rather than groups, they are required to use hand levels, they choose their own sites, and the staff participates more actively in the critiques, actually providing direct input and suggestions, and answering questions.

5 minutes

1. In a short classroom meeting, the trainees are told the objectives of this project and are given the instructions for the exercise. They are told that they will work in pairs and use hand levels and hand-made stadia rods. They will be taken to a large area, and from there they will be free to explore and choose their own sites. They are to select a site, do the necessary survey and analysis, and design and stake out an appropriate pond and/or pond system for the site. The pond should be staked out and presented in a clear enough manner that actual construction could follow with the intended results.

10 minutes

2. There is a brief discussion during which trainees should recognize what they will need to take into account and do at the sites, i.e.:

- Site selection: Trainees should take into account:
    - topography
    - soil
    - constraints such as trees, etc
    - water source
    - accessibility.
- Pond design: Trainees should:
    - Flag water source and know elevation (flag natural water course at ten meter intervals and calculate elevations)
    - Flag inlet canal
    - Know surface area of water
    - Flag point at which water enters pond

    - Flag dike (mark with at least 3 flags to a side)
        - toes, top width, where cut stops and fill begins
    - Flag pond bottom (line with greatest slope)
    - Flag drainage point
    - Flag drainage canal (to where it hits open ground)
    - Determine elevation of top of dike
    - Determine labor.

5 minutes
3. The following constraints are presented:
    - Pond should be designed to have 150 square yards to 300 square yards surface area
    - Assume there will be no access to pumps
    - Assume there is no PVC pipe available
    - Assume pond will be built by hand labor.

Trainees are reminded that they will be presenting their sites to a group. A lot of emphasis will be placed on the extension aspects of this exercise, and once again critiques will follow the presentations. The following should be stressed:

- All information organized in efficient manner
- Good visual aids and demonstrations (encourage creativity in developing new techniques for field demonstrations of important technical points)
- Based on the presentation, the group should have a clear understanding of the system.

11 hours
4. Trainees work in pairs in the field. As in the last site development exercise, trainers should circulate among the sites to observe and provide logistical support, but should not be involved in the trainees' work or decisions.

4 hours
5. Trainees give 15 - 20 minute presentations of their sites, followed by a ten minute question and answer period. Following this, the group evaluates the following:
    - Choice of site
    - Efficiency of use of land in the pond design
    - Completeness and correctness of design and staking clarity and style of presentation.

At each site, the trainers wait for the trainees to complete their discussion and critique, then add comments or suggestions regarding the technical and extension aspects of presentation.

Materials and Resources:

- As in the previous site development project, it is important that the staff chooses the general areas with care prior to this exercise. If there are not enough feasible sites, staff can assign given soil types, and/or allow trainees to mark imaginary water sources within certain restrictions (i.e. water sources must be at least some specified distance lower than the high point of a hill, etc.)

- Hand levels
- 1"x 2" boards of six to eight foot length, rulers and markers for making hand-made rods
- Soil auger or shovels
- Surveying flags and/or tape
- Newsprint, markers, other material requested for visual aids

Trainer Notes:

- For the site presentations, the group should be split up so that each large group sees about four sites. Pairs should not be separated. If there is a variety of types of sites (for example, some wooded, some where it is necessary to raise the water level with a dam, etc.), arrange such that each large group sees a representative of each type of site. Again, the logistics can be complicated and should be planned carefully by a staff member well in advance.
- This is a good opportunity for trainers to demonstrate some of the extension techniques they found useful as volunteers. Also be sure to acknowledge good, new ideas that the trainees come up with on their own.
- At the completion of this project, trainers should encourage the trainees to talk with them if there are still areas in which they are confused or nervous. Staff should offer to work with people who would like to do another site development exercise to further reinforce their skills.

Session IX-3: Wheelbarrow Project

Note: If wheelbarrows are being constructed as the carpentry project, and if they were not completed earlier in the program, they may be completed during Week Nine. Every effort should be made to have them completed earlier, however, as Week Nine is very full and also because it will be helpful to have the wheelbarrows ready for use during the pond construction project. This provides an excellent opportunity to field test the wheelbarrows and note design improvements for future application. Please see the section on "Masonry and Carpentry Projects" in Chapter Twelve for detailed notes on this project.

Session IX-4: Pond Construction Project

Total time: ***Approximately 20 hours***

Objectives:

- Reinforce all material that has been learned about pond design, staking out a pond, and pond construction;
- Provide actual hands-on experience through all phases of designing, laying out and constructing a fish pond from beginning to end;
- Build trainees' confidence in a difficult, often intimidating aspect of the job they will be doing overseas, thus enhancing their credibility as competence;
- Practice working in groups and coordinating on planning, logistics and labor;
- Develop leadership and management skills;
- Learn about effectiveness of various management styles.

Overview: In this project, trainees actually experience all of the steps involved in laying out and constructing a pond from start to finish. They work together as a group under the direction of the trainee coordinators to construct a small fish pond.

Note: This is a project that takes place over a long period of time. Thus, there will not be a written session design presented here. The following is a set of trainer notes that should be helpful regarding the project.

1. For something as tangible as pond construction, there is no replacement for actual experience. No amount of learning through lectures, reading, observation or even hypothetical practice that stops short of the real thing can be as valuable, or as confidence building, as physically going through the actual process. Site selection, pond design, the ability to stake out a pond effectively and actual pond construction combine to form one of the most challenging and intimidating aspects of the job of a fish culture volunteer. As trainees progress through the program, they develop their surveying skills, learn about the characteristics and requirements of a functional fish pond, do some field exercises in site development, and learn about site selection, pond design and pond construction through guest experts, the seminar presentation and observations on the field trip. They are never completely convinced that they are adequately prepared for this part of their job, however, until they put their skills to the test.

2. The two or three trainees who present the seminar on Site Selection/Pond Construction serve as the coordinators for this project. They should be selected for that seminar based on their technical skills or comprehension in this area and on their leadership abilities (if not strong in each individual, there should be a good balance among them to provide a strong team of coordinators while allowing the weaker member(s) to further develop their leadership skills).

3. One trainer, preferably one who has a lot of experience and very strong skills in pond construction, is the staff supervisor for this project. The trainee coordinators should work very closely with this staff member, and he/she should communicate with the group only

through them regarding the project. The coordinators submit all requests, plans, proposals, and needs to this trainer, and this trainer provides what is needed.

4. When the trainee coordinators are informed of their responsibility for this project, they should be given any information they will need to begin planning. If the site has been determined by the staff, the trainer should show it to them. If it is up to them to choose the site, they should be shown the general area and told about any restrictions, boundaries or other considerations of which they need to be aware. Keeping the site selection aspect to a minimum is recommended. Trainees should have some options to choose from, but should not have to spend too much time finding a site. The construction phase will be time consuming enough, and since trainees will get practice with site selection through other exercises, the more important points regarding that aspect is how the site is used, how the pond is oriented and designed to fit the site, and how the characteristics of the site affect the construction techniques and decisions.

5. The trainer should inform the coordinators of any other constraints, limitations or requirements. This should include information about the surface area of the completed pond. The staff may have decided upon a size that will best meet the needs of the owner of that land, or have some other guidelines that affect the size pond desired. It is recommended that the pond be limited to approximately 100 square meters in order to be able to complete it in the given time, but at the same time it should not be too small to provide a realistic experience and a sense of the labor involved.

6. As early as possible, the trainee coordinators should write up a plan for the project. Staff should keep in mind that they will be preparing their seminar presentation also, so the more notice they have regarding what is required of them the better. The plan should be submitted to the trainer in charge of the project. That trainer should review the plan immediately and carefully, and should meet with the coordinators to discuss any weak areas in the plan if necessary. The trainer will need to exercise judgement here. This is the trainees' project, and since they lack experience there is a good chance they may overlook something or make an occasional error. To some extent, this should be permitted to occur. They can learn many things as they go along and can solve certain problems as they arise. On the other hand, depending upon the circumstances it will probably not be advisable to allow so many mistakes to be made that the results are not viable (especially if the land belongs to a private individual rather than to the training program). This would not only be a waste of trainees' time and labor, and probably money, but it would also deprive the trainees' of the sense of achievement and diminish rather than build their confidence. There needs to be a good balance of input from the trainer so that trainees have possession of their project (and the sense of accomplishment that comes with that), but still receive guidance to an appropriate extent.

7. The trainee coordinators present their plan to the group. Although they should get some input from the group, they should have done a thorough job and they should make the decisions. There is not enough time to do all phases of this project through group consensus. This will be a real test for the coordinators since they also need to find a balance between accepting helpful input from the group but being willing and able to make decisions.

8. In addition to all of the technical aspects, the coordinators need to plan how the actual construction will be organized. All trainees are to be involved, and everyone should understand what is going on at all points. What seems to work best is for the coordinators to have meetings with the group every few days to keep everyone posted and make announcements. In addition, there can be a sign-up sheet where all trainees keep track of the number of hours they put in at the work site. The coordinators can assign a set number of hours required by each trainee based on their estimates, then the trainees can work at the site during flexible hours as they see fit. The coordinators can set up a rotating system among themselves so that one of them is always present at the site (during flexible time blocks) to provide direction.

9. The coordinators should assign one or two trainees to serve as recorders. These trainees keep track of what is done each day, the order of events, the number of man-hours of labor, etc. At the end, they can put this information together to share with the group at the processing meeting.

10. In past programs, the construction project usually began during seminar preparation or presentation weeks, though time was limited. Scarifying and beginning the core trenches was usually as far as it got during that time. The remainder of the work generally took place after the field trip. An alternative to this spread out approach is to schedule in two or three full days strictly for pond construction. The advantage of this is that everyone is in touch with all stages and less time is wasted transporting tools back and forth. Trainees can focus completely on this one project and really immerse themselves. Disadvantages are that it may be difficult to schedule this way due to logistical considerations, and also that the work is entirely physical labor, so trainees may not have the stamina to use the whole time efficiently.

11. Since this project does involve such difficult physical labor, it is important that trainees and staff concentrate on health and safety. Make sure drinking water, sunscreen and insect repellent are available at the work site, that trainees dress appropriately, including hats and work gloves, that first aid kits are handy, etc. This is one of the few times in training that bringing a tape player to the work site is appropriate. Lively music can help people maintain their energy and enjoy working together.

12. Although time will be tight, make every effort to have trainees fill and drain the pond they have constructed. This will provide an opportunity to make sure everything functions properly and, if everything does, provides a tremendous sense of accomplishment.

Resources and Materials:

- Trainees may ask to speak with an expert such as the person who spoke to them about this topic earlier in the program, an experienced contractor, a soils expert, a mason, etc.
- A viable pond site with a water source and drainage area.
- Dumpy level, tripod, stadia rod, hand levels, string levels, twine, surveying flags, surveying tape.

- Sufficient tools such as shovels, picks, adze, hoes, rakes, wheelbarrows (this is a good opportunity to field test wheelbarrows made by the trainees), tamping tools (can be made by the trainees).
- Lumber, nails, screws, cement, sand, gravel, rebar, PVC pipe, etc. as needed for making inlet or drainage structures, and hand tools as needed for the same purpose such as saws, hammers, screwdrivers, chisel, etc.

Session IX-5: Final Reports

Total time: 45 minutes

Objectives:

- Provide opportunity for trainees to process what occurred over the course of the growing season in their own ponds from beginning to end;
- Provide opportunity for trainees to thoroughly examine and synthesize their results, interpret those results, draw conclusions and assess their pond management techniques and strategies;
- Provide opportunity for trainees to look at their pond work from the perspective they now have, and to see how all of the technical material they have learned could be applied to or was reflected in their own aquaculture experience during training.

Overview: Throughout the training program, even as they are involved in many other activities, trainees continue to work with their ponds as fish farmers. Writing the final report is the culmination of this work, and it is extremely important. Weekly reports describe short periods throughout the growing season, but the final report looks at the entire growing season as a whole. Since the trainees harvest their ponds, they have an opportunity to learn the actual results of their efforts. In writing their final reports, they analyze why those results were obtained. They find out whether or not they have been successful fish farmers from the economic standpoint, and to apply everything they have learned to their interpretations and the conclusions they draw. The following includes a design for a session in which trainees are informed of some of the guidelines and the format for the final reports, as well as a set of trainer notes with further information about the content and reviewing of the reports.

5 minutes

1. The trainer who is in charge of reports makes the following points regarding the final report:

- The final report should allow the staff to understand all that the trainee has done and observed in his/her pond, from the initial goals to the final results. The trainees should make connections and draw conclusions.
- While information and knowledge they obtained from seminars and the field trip will be important in helping them analyze their observations, they are not to regurgitate all of that information in this report.
- The audience to whom they are writing is the training staff.

25 minutes

2. The trainer informs the trainees of any other specific guidelines or requirements regarding any part of the final report, and provides necessary information regarding the format. (See Trainer Notes for examples)

5 minutes

3. The trainer reminds the trainees that the same standards apply to the final reports that were set for the weekly reports regarding professionalism, neatness, conciseness,

completeness, clarity, and organization. The trainees are informed that, if anything, trainers will be even more strict about these standards.

10 minutes
4. The trainer explains the procedures regarding submitting reports, evaluation, redos and acceptance. For example:

- The reports are due two days to the half-day after completing your final harvest. (If you finish harvesting before noon on Tuesday, the report is due at noon on Thursday. If you finish harvesting at 3:00 on Tuesday, the report is due at 5:00 on Thursday). Remind trainees that it is not to their advantage to procrastinate, and turning in reports earlier than the due time will speed up the process and mean that they will be able to have their final interview sooner.
- Final reports are to be turned in by giving them to the trainer in charge of reports (he/she will distribute them to the appropriate trainer), or by placing them in the box that will be just outside of the staff office.
- Your final reports will be evaluated by the same trainer who has been reading your weekly reports throughout training. Once the first draft is submitted, you will deal directly with that trainer. You will be notified about required additions, redos, changes, etc. and the trainer will arrange further meetings with you on an individual basis as appropriate.
- The trainer who is evaluating your report will notify you when it has been accepted.

The trainer asks allows trainees to ask questions and clarifies any points of confusion, then concludes the meeting.

Resources and Materials:

- Prepared newsprint with format information, if desired, and masking tape
- Blackboard, chalk, eraser
- If desired, the trainer in charge can make up a checklist or worksheet to help trainers go through the reports. Each trainer would receive one worksheet for each trainee whose report s/he will evaluate.
- Box or other container placed in specified place near staff office for trainees to submit their final reports
- Make available to trainees throughout final reports writing:
    - Graph paper
    - Notebook paper
    - Rulers
    - Markers
    - Colored pencils
- For staff members:
    - Small post-it notes (for making comments on reports)
    - Red or blue pencils, if desired.

Trainer Notes:

- Final reports are very time consuming. Because they really demand that the trainees synthesize all of their experience and apply everything they have learned to the interpretation and analysis of their results, they are extremely valuable and a major part of the program. Despite the tremendous amount of work involved, trainees should enjoy and be excited by what they learn through the writing of this report. It is, therefore, important to be open and clear with trainees regarding any required format or other criteria. Trainees should not have to waste time on "busy work" because they were not aware of some specific preference of the training staff regarding the format they use.
- The degree to which the staff chooses to standardize the format or demand very specific ways of presenting certain material is up to that staff, but once the decisions have been made, they should be explained to the trainees and all staff members should be consistent in upholding them. It should be clear which elements of presentation are left up to the individual trainees, and all staff members should be consistent in allowing individual approaches for those areas provided they are reasonable and effective in serving the purpose they are meant to serve.
- An alternative to having the staff determine the format is to approach it similarly to the way weekly report formats were set. That is, one or two trainees can be selected to design the format. If this is done, the trainees should work with the trainer in charge of reports to be sure their format will meet the needs of the staff, then they should present it to the group.
- A question that always comes up at this point is whether or not trainees may have access to their weekly reports to help them write the final report. Strictly speaking, the trainees should have all of the information from the weekly reports in their own records since those reports were submitted with the understanding that they would be kept by the training staff. However, in reality many trainees were not as well organized as they should have been, especially early in the program. Arguments could be made for either case regarding the pros and cons of permitting them to review their weekly reports. In this program, although we pointed out to the trainees that they shouldn't need to see their weekly reports, we did allow them to borrow them to facilitate the writing of the final reports. They were required to return the weekly reports along with the final report when they submitted it so that the trainer would have access to the raw data and other information found in the weekly reports.
- Once final reports begin to come in, trainers are overwhelmed. It is important that trainers realize this will happen and that they prepare themselves. The trainer in charge of reports should have a staff meeting to thoroughly explain exactly what the trainees have been told is required of them. Every effort should be made to ensure consistency among the staff. The trainer in charge of reports will be too busy with his/her own set of reports to check the comments made by trainers on all of the other reports. He/she should do some spot checking if possible, but as more reports come in this will become unfeasible.
- For the trainees, writing the final reports is an intense personal experience. It requires a great deal of work and thought, and requires that they do an in-depth analysis and assessment of their own work that has been a major component of their training. They are often excited by what they learn as they go through this process. Trainers must be sensitive to this. It is difficult to read five or six final reports without losing interest, but you owe it to the trainees to try to read each one with a clear mind, pay attention, and

make useful comments. Try to focus on the content and the comprehension demonstrated by the analysis and interpretations the trainee makes so that you help him/her go as far as possible with the analyses. Encourage the trainee to squeeze all of the learning possible out of this experience and try to convey a positive attitude that will help the trainee appreciate his/her own observations.

- Trainers should work directly with the trainees whose reports they are evaluating. Try to turn the work around in a timely manner and be clear about what you are requiring when returning work for a redo, addition, change, etc. When you feel the report is acceptable, inform the trainee that s/he will be told what time to report for his/her final interview. Trainers keep the final report until the final interview.
- An example of format information for final reports follows. In this list, quite a bit of detail is provided regarding the expected content of each section. The degree to which these details are discussed with the trainees is up to the discretion of the staff. In many cases, they are obvious and probably don't require too much elaboration.

Title Page (similar to weekly report)
Table of Contents
Introduction (should introduce the paper, state its purpose and relate essential information that will prepare the reader for what will follow) It should include:

- pond number
- goals
- stocking information
    - date
    - number
    - total weight
    - average weight
    - species stocked (complete species name)
    - size and age (optional)
- net yield in weight/area/time
- profit/loss

Site and Pond

- Pond description
    - location, map (illustrates system, reference point)
    - surface area
    - depth
    - dike dimensions
    - water supply
    - drainage
    - slopes of bottom, dikes and drainage (optional)
    - soil type
    - vegetation

Materials: The items listed below in this category are not comprehensive; trainees should list all materials and describe in detail. (For example: Seine - 50 ft. long, 6 ft. deep, 1/4 " delta mesh, treated.)

- Transport
    - vehicle
    - aerators

    - tanks
  - Pumps
    - size and flow rate
    - power
    - type (diaphragm, centrifugal, electric)
  - Nets
    - type (seine, cast, dip)
    - length and depth
    - mesh size and type
    - treated or not
    - material
  - Scales, measuring boards, etc.
  - Grass seed
    - type
  - Water quality testing equipment
    - Hach kit or other test kits
    - Secchi disk or stick
    - Plankton net
  - Tools
    - shovels, hoes, rakes, machetes, etc.

Management: Made up of the various relevant sections (as in weekly reports).

- Pond preparation
  - preparation of bottom
  - grass cutting
  - draining
  - addition of water
- Stocking
  - for each species:
    - name
    - number
    - average weight
    - total weight
    - range of weights and/or sizes
    - source
    - age
    - date
    - handling
- Transport
  - method
  - handling techniques
- Fertilization
  - Type
    - NPK ratio
    - animal or plant source, if organic
  - amount
  - schedule
  - application method

    - results: visual observations, water quality changes
- Feeding
  - date begun
  - Type
    - sinking vs. floating
    - pellets, meal, brans
    - % protein
  - schedule
  - amounts, percent body weight fed
  - method of feeding
  - observations on feeding behavior
- Maintenance
  - dike repair
  - cut grass, etc.
  - water level control (inflow/outflow, standpipe changes)
  - predator control
- Reproduction
  - date of first fry observed
  - date of first nest building activities, other reproductive behavior
  - average weight of fry at harvest
  - estimated number of fry at harvest
- Sampling and Growth
  - sampling schedule
  - sampling method
  - results for each sample
    - average fish weigh
    - total estimated standing crop
    - percent population sampled
    - total sample weight and number of fish
  - growth rate
  - FCR
  - graph of growth
  - mortality
- Water Quality
  - testing schedules
  - quantitative data: DO, temp, pH, turbidity, CO2, hardness, alkalinity
  - qualitative data: color, weather
    (Note: Raw data need not be presented in the report. It is sufficient to note that they were measured and recorded, and to note trends, correlations, and extremes)
- Harvest
  - yield (weight and weight/area/time)
  - number of fish (each species)
  - average weight of fish (per different size group if applicable).
  - total weight of fish (net and gross)
  - number and weight of fry
  - % survival

    - method
    - date
  - Post harvest maintenance
  - Marketing
    - account for all movement of fish (including sales, giveaways, storage)

Accounting

    - itemized list of all expenses and gains
    - total expenditures
    - total income
    - net loss/profit

Discussion and Conclusions

    - problems and solutions
    - results: yield and profit/loss, degree of success in relation to goals
    - explanation regarding yield and profit/loss.

Additional Notes:

  - Data should be presented in synthesized, useful form. Choose the form that best suits that set of data and presents it in the most meaningful way. Graphs, charts and diagrams should be clearly labelled and neat. Graph paper is available.
  - Methods should be included for each appropriate section and should be clearly explained. Be clear and precise. With methods used for water quality tests, include information like the time(s) of day a test was performed, the location and depth at which it was performed, etc., but it is not necessary to copy the Hack kit instructions. "per Hach Kit instructions" is sufficient.
  - Where appropriate, figures should be standardized to help the reader visualize and make comparisons with familiar standards. For example, production figures should be expressed in pounds per acre and kilos per hectare (or are) in addition to the specific figures for that pond.
  - Express figures in both metric and english units.

Session IX-6: Pond Interview - Week Nine

Time frame:* *Approximately 20 minutes per trainee

Note: This pond interview should take place fairly early in the week but after trainees have had a day or two to work with their ponds since returning from the field trip. With so much else to do and the final harvest day in sight, it is tempting and easy for trainees to rationalize a relatively static management approach at this point. It is important to encourage them to utilize their ponds up to the last possible minute, and this pond interview can be helpful in getting that point across. Please refer to Pond Interview: Week Four in Chapter Twelve for objectives, overview, procedures and trainer notes. Everything remains the same in this pond interview except the questions. An example of the questions that can be asked in this interview follows:

Date: __________ Name: ______________________________

1. How many times have you sampled your pond? When was your last sample, and what technique did you use?

2. Based on your last sample, what is the average weight of your fish and how much have they grown? What has been your FCR?

3. If you were an extension agent visiting this pond, what advice would you give the manager?

4. What changes or modifications have you been making in your management since returning from the field trip to maximize production?

5. Do you anticipate making a profit next week? Why or why not?

Session IX-7: Personal Interview - Week Nine

Time frame: Very variable. Approximately 20-30 minutes per trainee.

Objectives:

- Provide opportunity for trainees to assess their performance in the program and their progress since the last interview in areas they have targeted for improvement;
- Provide feedback to trainees regarding their performance and progress and share any suggestions the staff has regarding the trainee's continued work during in-country training;
- Encourage trainees to focus on their own suitability, feelings and sense of commitment to spending two years as Peace Corps Aquaculture Volunteers;
- Provide each trainee an opportunity to express any concerns, ask questions, or discuss any issues he/she may wish to share with the staff.

Overview: This is the last personal interview before the final interview. It should be very open and any major issues that concern either the staff or the trainee should be discussed at as much length as is appropriate. This is an important time for trainees in terms of really making decisions. At this point, the end of training is in sight and the concept of spending two years overseas as a fish culture extensionist is much more real. It is a critical time of self-assessment, not only in terms of skills and performance, but also regarding attitude, desire and commitment level. The format for the interview is similar to the last one, but there should be a lot of flexibility to accommodate the needs of each trainee. The questions posed in this interview are meant to en courage the trainees to think about what they have learned about themselves in training in terms of working overseas as volunteers.

Note: Please review notes from personal interviews discussed in Chapters Twelve and Fourteen.

1. The trainees are again asked to review the self-assessment forms they filled out for the third week interview, and to think about their progress throughout the program. They should identify and be prepared to discuss the skill areas in which they feel the strongest as well as those in which they still lack some confidence, this includes both technical and non-technical skill areas. In addition, trainees should be reminded that this is a very critical time to give careful, honest thought to the commitment they will be making when they go overseas. In light of what they have learned about the job of aquaculture extension and about themselves, they should really examine their own feelings about the decision they must make over the next week or so.

2. As in previous interviews, this one will be conducted by the Master Trainer and at least on other trainer. Both trainers greet the trainee, and the Master Trainer reminds the trainee that the staff members might jot down some notes during the interview to remember points they wish to return to.

3. The trainer asks how the trainee feels now about the goals he/she set for him/herself at the beginning of the program, and about the progress he/she has made toward achieving them.

4. The Master Trainer asks the following questions. The order in which they flow and other follow-up questions depend upon the trainee's responses and/or concerns expressed.

- After eight weeks of training, managing your pond,presenting and listening to seminar, going on the field trip, etc., you now have a much better idea of fish culture and fish culture extension. You probably have some new perspectives on the job you'll be doing overseas. Thinking about what you know about you personal qualities and characteristics and reflecting back over the past eight weeks, in what ways do you feel you are particularly well suited to aquaculture extension work? What aspects do you think may be more difficult for you?
  Note: Trainees turned in an assignment related to this question after returning from the field trip. Staff members should be sure to read those before this interview as their may be points in them that could be referred to during this part of the interview.
- How are you feeling at this point about you commitment to spending the next two years working in (country name) as a Peace Corps Volunteer in the aquaculture program?
- Is there anything else you'd like to talk about today?
- Getting back to the present, what are your plans for squeezing the most out of this last two weeks of training?

Feedback is shared throughout this section of the interview as appropriate based on issues raised (or not raised) by the trainee. The staff members can provide some of the staff's perceptions regarding the master trainer's first question, and can make suggestions regarding the last question. In any case, in concluding each interview the trainee should be encouraged to make the most out of his/her training right up until the last minute.

Trainer Notes:

- The timing of this interview might seem strange since it occurs so close to the final interview. This is another case of a modification that was made based on experience. In earlier programs, this personal interview was scheduled for week seven, and then the final interview was the only remaining interview. There were a few problems with this. For one thing, since week seven is completely full with seminar presentations, it was extremely difficult to fit in the interviews. If they were to happen at all, they had to be kept extremely short. The trainees tended to be tired and distracted by their seminar responsibilities and were not really prepared to focus on self-assessment and other matters discussed in the interview.
- Upon returning from the field trip trainees often have some new perspectives. They have had an opportunity to learn more about the job they are preparing for and to see it in practice. They have had time to reflect on what they are doing and on what they are about to commit to. With the end of training suddenly looming close, they often give more thought to what they will soon be leaving behind. For many trainees, this is the first time they really face the decision they are making in joining Peace Corps, and in some cases they have a need to talk things out. Thus, both logistically and in terms of best meeting the needs of the trainees, this turns out to be a much better time for this interview than week seven.

- One final point is that, by having an interview close to the final interview, the staff has an opportunity to discuss any issues that may be uncomfortable or difficult before the final interview. In borderline cases, this gives the trainee another opportunity to make specified improvements if necessary. In any case, since the tone of the final interview should be, if at all possible, upbeat, positive and confidence-building, it is best to get more difficult issues dealt with prior to that time.
- If possible, staff members should meet very briefly with each trainee during week seven after the trainee has completed his/her seminar presentation to allow the trainee to discuss his/her own perceptions about the presentation and to provide specific feedback on it from the staff's point of view.

Session IX-8: Country Specific Information

Time Frame: Very variable depending upon number of countries represented, number of visitors or staff members with information about those countries, and the programs prepared by those individuals.

Objectives:

- Provide trainees with information about the specific country to which they are assigned regarding the programming and technical aspects as well as the social, cultural and political aspects of living and working in that country;
- Provide opportunity for trainees to meet and talk with people who have lived and worked in the countries to which they are assigned;
- Provide trainees with as broad as possible a perspective about technical and programming approaches practiced in as many countries as are represented by the group's assignments.

Overview: Throughout the first eight weeks of training,trainees were urged to concern themselves with the generic technical and personal skills that will be important for all of them in effectively carrying out their duties as aquaculture extensionists. At this point in the program, they are provided with more of the specifics that relate to the countries in which they will be working, and have an opportunity to learn more about actually living and working in those particular countries. This will be a set of trainer notes rather than a session design.

1. The means by which trainees receive country specific information varies. Some examples include:
   - Written material provided by either Peace Corps/Washington or Peace Corps field staff from the individual countries, or existing in training program files.
   - Slide shows, lectures and question/answer periods facilitated by a visitor who has worked in the countries of assignment. These visitors may include Returned Peace Corps Volunteers, Volunteers who are temporarily in the United States on home or medical leave, Peace Corps/Washington staff members who are very familiar with the countries and their programs, and visiting Peace Corps field staff or ministry personnel from the assigned countries.
   - Slide shows, lectures and question/answer periods facilitated by training staff members who served in the assigned countries.

2. Arrangements for visitors should be made well in advance. Lodging and meals should be set up and the staff and the visitors should be clear about how payment will be handled. Flight times should be verified and staff members should be designated for picking up and dropping off visitors at the airport as necessary.

3. Trainees should be told about who will be visiting and informed of any special considerations of which they should be aware regarding appropriate protocol or the kinds of information this person might best be able to provide.

4. See trainer notes in Field Trip Debriefing/Reentry to Training section regarding written information to be provided to trainees.

5. Since the trainees will be very busy and distracted during the days, it often works out best to schedule meetings with visitors or trainers in the evening. Slide shows and question/answer periods are usually informal and enjoyable. Attention should be paid to the trainees' energy level and other responsibilities in scheduling evening meetings, and if possible, they should be staggered so that trainees do have some evenings free.

6. In addition to the scheduled meetings and slide shows,trainees should be encouraged to spend informal time with visitors at meals or during free time. In some cases, it works out well for visitors to meet informally with individual trainees during the day as well.

Resources and Materials:

- Written information provided by Peace Corps/Washington, Peace Corps field staff or from program files. When feasible, each trainee should receive his/her own photocopy of the material about the appropriate country. If some documents are very large, two or three trainees can share a copy, and arrangements can be made to make more individual copies upon request.
- Maps of the countries to which the trainees are assigned.
- RPCV's, field staff and/or other resource people as listed above who have experience living and working in the countries of assignment, particularly in the aquaculture programs.
- Slide projector and screen (with necessary carousels, extension cords, etc.).
- Overhead projector, if necessary.
- Comfortable place to meet in evenings.

Session IX-9: Trainer Panels

Total time:* *Variable. Approximately three panel sessions at 1 1/2 to 2 hours each.

Objectives:

- Share staff members' experiences, knowledge and techniques with trainees;
- Provide specific information regarding aquaculture practices in countries in which trainers served;
- Provide examples, through sharing experiences, of how concepts learned and observed during training can be applied to an in-country situation;
- Provide opportunity for trainees to fill in gaps in their information, clarify technical points on which they are still not clear, and ask any remaining technical questions.

Overview: This is really the first time in the program that the staff formally serves as a direct resource. During these panel discussions, trainees have the opportunity to pose any questions they may have about fish culture, extension or other aspects of working as a fisheries volunteer overseas. Though the discussion is mainly directed by the trainees,staff members may also choose to speak about topics they feel are especially important or need further reinforcement, or to volunteer specific techniques of which they are aware that they feel trainees may find helpful.

1. Prior to each trainer panel session, the trainees are informed of the topics to be discussed at that session. They are encouraged to prepare their questions in advance so that the time can be used effectively, and to try to limit questions to the topic under discussion.

2. For the panel discussion, chairs can be arranged in a large circle, or if that is not feasible, the staff members (as well as any visiting RPCV's) sit facing the group at the front of the room. Either one staff member or a specific trainee may serve as the coordinator for the discussion, keeping everyone on the topic and accepting questions in an organized way.

3. To begin the session, the trainer coordinator should introduce each staff member (or have each staff member introduce him/herself), including information about the country in which each person served and any special areas of expertise, experience or highlights of service.

4. Trainees address their questions to specific staff members or to the staff as a group. The discussion inevitably becomes lively and everyone is encouraged to get involved, though it is important to maintain some order and be cautious about spending too much time on tangents.

5. As each panel session comes to a close, the person coordinating should review the topics that have been addressed and notify everyone about the topics to be discussed in the next session.

Resources and Materials:

- Comfortable meeting area
- Blackboard, chalk and eraser for listing topics or for illustrating points that arise during the discussion
- Trainers may choose to bring some technical slides or other visual aid materials if they wish to describe specific techniques.

Trainer Notes:

- As stated above, these panel sessions can be coordinated by either a staff member or by a trainee. It is best to give the responsibility for designing and implementing the format to a trainee. Be sure to select a trainee who has good organizational and leadership skills. Work closely enough with him/her to be sure the format is organized enough and well thought out enough to work. If the format is left too open (for example, if topics are not addressed in some set order, one at a time), the discussions can become chaotic and may wander so much that a lot of information is either overlooked or repeated. Thought should also be given to how questions should be posed and how it will be determined who is to answer them or in what order.
- Using the seminar topics as a way of dividing the topics for these discussions works pretty well. Staff members will be able to help the coordinator determine which topics are likely to take longer to address than others so that the topics can be grouped in a way that uses time the most efficiently.
- For the staff, trainer panels are exciting. It is the first opportunity staff members have to be completely open in sharing all of their knowledge and experiences. This is generally a very positive aspect of these discussions and they tend to be very dynamic and lively. At the same time, however, they can be frustrating because there is so much more to talk about than there is time. Trainers need to be prepared for this and to do some prioritizing in their own minds as well as being sensitive to what the trainees want to learn about. It is true that there will be some information the staff wants to provide that the trainees will not even know to ask, and staff members should bring up these issues, but there must be a balance and staff members have to accept that they will probably not be able to say everything they'd like to say.
- Another point about which staff members should be cautious. If topics are arranged similarly to seminar topics, keep in mind that regardless of your own opinions about the relative importance of the different topics, trainees put a tremendous amount of effort into whichever topic they presented. One of the basic tenets of the training program is that it is important to have a broad base of knowledge and a wide range of skills in order to be prepared for any situation. Therefore, avoid thoughtless remarks like "Oh, don't even worry about that topic. You'll never even have to deal with it".
- The more trainer panels that can fit into the schedule the better. Inevitably, everyone is frustrated that there isn't more time. The panels should not be too long, however, because people can only absorb so much information at once, especially when they have a lot on their minds as the trainees certainly will. That is why several hour and a half to two hour sessions are better than one very long one. Trainers are encouraged to continue meeting and talking with trainers during informal and free times (meals, weekends, doing laundry, etc.) if trainees wish to do so.

Session IX-10: Male and Female Volunteer Issues

Time frame:* *Approximately 1 hour 30 minutes

Objective:

- Provide opportunity for trainees to ask questions or discuss issues about volunteer life that they may be more comfortable discussing among others of their own sex.

Overview: As the time draws near for trainees to depart for their countries of assignment, they often have concerns or are curious about various aspects of daily life as a volunteer. In some cases, these issues include topics that they are more comfortable discussing in smaller groups with trainees and staff members of their own gender. This is not a designed session, but is an informal meeting meant to provide a setting in which these issues can be addressed. Since there is no set format, the following is simply a set of trainer notes.

1. These meetings are generally held in the evening, when trainees are fairly relaxed. Be careful not to schedule them for the evening before trainees have a major assignment due. In fact, explain what the meetings are about and let the trainees choose the time and place.

2. These are very informal and can take place in a trainee or staff member's room, a restaurant or some other comfortable location that is conducive to privacy and conversation.

3. The group is divided, with male trainees meeting with male staff members (and possibly visiting RPCV's, if appropriate), and female trainees meeting with female staff (and RPCV's).

4. There is no set agenda for these meetings. Trainees may bring up whatever they wish to discuss. Sometimes the meetings are very short, other times trainees have a lot on their minds. Examples of issues that have come up at past meetings include:
   - What personal items are available and how they may be obtained in country (and what should be brought to the country with them);
   - Mores and social customs regarding use of alcohol;
   - Appropriate dress and/or how different types of appearances and dress may be interpreted;
   - Specific aspects of social behavior (how various actions or behaviors may be interpreted, pressures that may be exerted or expectations that host country nationals may have of Volunteers;
   - Dating between Volunteers and/or between a Volunteer and a host country national;
   - Frequency with which volunteers socialize or meet;
   - Various health issues (these topics are best left for the medical orientation portion of in-country training);
   - Credibility of women in their role as extensionists;
   - Roles of men and women in the host country society;
   - Women in development issues;
   - Host country health and child care conditions.

5. Staff members should not use this as an opportunity to preach, nor should they feel that they have to share more of their private lives than they care to. They should, however, be honest, open and sensitive in their reactions to questions or comments that may arise and in their willingness to discuss whatever topics concern the trainees.

6. Staff members should make it clear that they speak based on their own experiences, observations and opinions, and that they are not speaking as official representatives of Peace Corps or as medical experts. If they are aware of Peace Corps policies regarding particular issues, they should inform the trainees of them, but in any case they should encourage trainees to obtain further information regarding Peace Corps Policies and/or medical information in the appropriate areas of interest.

Session IX-11: Level of Intensity Assignment Wrap-Up

Total time: 1 hour 30 minutes

Objectives:

- Examine possible approaches for the situations described in the management strategies assignment trainees worked on during the field trip, analyze the decisions that must be made and the information that must be taken into account to make good decisions;
- Synthesize and reinforce technical material covered throughout the program and examine how the information and concepts are put together appropriately when applying them to different situations;
- Provide opportunity for trainees to put their knowledge to use in developing strategies for actual situations (assignment is based on situations encountered by Volunteers in various countries).

Overview: This is a trainee-facilitated session in which trainees work as a group to develop management strategies that would fit the situations described in the assignment given during the Levels of Intensity seminar. Trainees have already worked on this assignment on an individual basis, and in this session they can share their ideas and learn from each other as they try to arrive at group decisions. Since the session is designed by the trainees, the following is a set of trainer notes rather than a design.

1. This session is facilitated by the trainees who presented the Levels of Intensity seminar. This is one of the two "special technical sessions" listed in the schedule presented in Part B of the Field Trip Debriefing/Reentry to Training session.

2. The Master Trainer or another designated trainer should work closely with the trainees to help them understand the objectives of this session and their roles in designing and facilitating it. The actual design is then up to the trainees. Be sure to give them as much notice as possible so that they can do a good job of designing a useful and interesting session.

3. Usually, and if the session goes as it should, there is a lot of group participation and a healthy amount of argument. Clearly, there is not really a single correct solution to the assignment, and one of the best things about doing this as a group is for the trainees to see how many options there are, how different people approach the task, etc. Thus, the time limit should be firm or this session can go on indefinitely. An hour and a half is the recommended time limit. It is entirely possible that all of the three situations will not have been addressed by this time, but if the group has reached an agreement about one or two of the scenarios, that is sufficient considering all of the valuable discussion that has probably taken place.

4. The wording of the original assignment was as follows (see page 242):
    - For each of the following cases, develop two appropriate management strategies; the most basic, simple one that will give reasonable results, and one that is more

complex. For each, tilapia must be used (though you are not limited to tilapia). Address all aspects of management, all major decisions that the manager must make.

1. Length of growing season - 12 months
   Market size - 100 g (3.5 oz)
2. Six months of optimum growing conditions, remaining six months are cool enough to inhibit reproduction and slow growth
   Market size - 250 g (9 oz)
3. Length of growing season - 12 months
   Market size - any size fish is marketable.

5. The following is a list of suggestions to consider when discussing the session with the trainee facilitators during the planning stages:

- Although the assignment asks for two strategies for each situation, there will not be sufficient time to come up with six separate strategies during this session. Therefore, they need only do one strategy for each of the scenarios. They may choose the level of simplicity/complexity for the strategy they develop in each case.
- Suggest that the trainees consider all of the decisions to be made, and all of the "givens" to consider.
  - For example, decisions include species, stocking weight, stocking density, age of fish stocked, feeding (yes or no, what, how much, how often, etc.), fertilizing (same questions as feeding), harvest schedule,type of harvest, etc.
  - "Givens" include many of the the other things that must be taken into account. For example: pond size, number of ponds, availability of fish, growth rate that can be expected (based on various approaches to feeding and fertilizing as well as age of fish, etc.), types of feeds and fertilizers available and relative costs, types of equipment available (mechanical aeration, for example), carrying capacity (given a set of circumstances), distance from market, type of transportation available, etc. (The assignment itself provides information about other major considerations).
- In order to prevent total chaos and impose some sense of order, the facilitators should set most or all of the givens once the items that must be taken into account have been listed. This will leave the group free to make the decisions based on a set of known circumstances.
- Once the circumstances are defined, the group should consider all possibilities. As decisions are made, they should be justified. Have the group make all decisions (i.e., design complete management strategies) to describe complete cycles from beginning to end.
- Once strategies have been designed, analyze each to determine how it could be modified if the farmer decided to become more or less intensive. Another interesting point to explore would be how a farmer might modify the strategy if some item became available that was not available before, or if the relative costs of certain items changed. (There probably won't be enough time to do a lot of this sort of thing for three different strategies, but some discussion along these lines is valuable, interesting and fun).

- How the circumstances are set is up to the trainee facilitators. A couple of approaches that have been used in the past include:
    - Setting up very different "givens" for each of the three scenarios (except for the information that each scenario is comprised of), then going through the same list of decision points (decisions to be made) for each situation.
    - Assuming the same "givens" for each of the three scenarios (except for the information that makes up the scenarios), and looking at how each decision would be made to fit each situation
- The trainee facilitators should realize in advance that there will be a lot of disagreement and arguing among the group, and there is no exact "right" answer. The merits and possible disadvantages of all proposed ideas should be discussed. Since there is not likely to be a consensus on every point, the facilitators must be prepared to stay in control and make the calls when necessary to keep the session moving. They will need to exercise judgement to avoid both cutting off a good argument too soon and letting an argument go on too long.

6. Point out to the facilitators (so that they, in turn, can point out to the group) that although the task may seem difficult and frustrating, this is precisely the sort of thing they will be doing as fish culture extensionists. They should acknowledge and be encouraged by their own abilities to tackle the problems and by the broad base of knowledge and experience they now have to draw from that enables them to make reasonable decisions. Staff members and trainees alike are often quite struck by this session because as trainees discuss and argue, often quite loudly and passionately, the knowledge and confidence they have gained over the course of the program really become apparent.

Session IX-12: Basic Management Strategy for Oreochromis niloticus

Total time: *1 hour, 10 minutes*

Objectives:

- Summarize the advantages of *Oreochromis niloticus* as a culture species;
- Discuss a basic, simple plan for managing *O. niloticus*.

Overview: This is a trainee-facilitated session. It is one of the two "special technical sessions" that is listed in the schedule presented during Part B of the Field Trip Debriefing/Reentry to Training session. Trainee facilitators summarize the characteristics of *O. niloticus* that have made it the culture species of choice for so many aquaculture programs, and present a simple, basic management scheme that can be used to raise *O. niloticus* successfully in light of its characteristics.

25 minutes

1. Trainee facilitators review the characteristics that would be desirable in a culture fish. (Refer to the list of characteristics of "the ideal fish" that all trainees made as one of the first steps in developing their management plans). They then compare various tilapiine species, catfish and carp in light of these characteristics. As they do this, it becomes apparent that *O. niloticus* possesses more of the desired characteristics than most or all of the other species.

35 minutes

2. The trainee facilitators present a very basic, simple management strategy that can be used to successfully raise *O. niloticus*. Emphasis is placed on how the presented plan takes into account the characteristics of this fish, including the potential problems that are often encountered in culturing it.

10 minutes

3. The trainee facilitators entertain questions and clarify any points of confusion. In concluding, they should acknowledge that, as seen in the last session (Levels of Intensity Assignment Wrap-Up), there are many management options, and every strategies must be designed to fit the specific situation. However, the plan that they have presented is a foundation; it is the most simple, basic plan that allows a farmer to maintain control (given the special characteristics of this fish), and virtually ensures successful management. There may be some situations that demand that this plan be modified to accommodate them, and other more elaborate or complex plans might be developed, but in a sense they all build on this very basic foundation.

Resources and Materials:

- Blackboard, chalk, eraser
- Newsprint and markers for preparation of visual aids
- Flip-chart stand and/or masking tape
- Other supplies trainee facilitators may request for preparation of visual aids.

Trainer Notes:

- The staff should select two or three trainees to present this session. They should be trainees with good leadership and communication skills who are well respected and credible among their peers. Notify them as early as possible so they can begin preparing the session.
- For the first part of the session that involves reviewing desirable characteristics and comparing fish species in light of those characteristics, suggest that the trainees make a large chart that lists the characteristics to consider on one axis and the species on the other. They can then fill in the information about each characteristics as it applies to each fish. In evaluating characteristics the following should be considered: growth rate, feeding habits, possible feed conversion ratios, ability to utilize plankton blooms, tolerance ranges for various water quality parameters, temperature tolerance, ease of getting fish to spawn, age at sexual maturity, fecundity, hatch rate, fry survival, spawning frequency, dress-out percentage, etc. On the chart mentioned, the information about each category is filled in for each fish. The information on this chart is filled in prior to the presentation.
- On another chart, the characteristics that are desirable are listed on one axis while the species are listed on the other. (For example, instead of saying Growth Rate, it would say Fast Growth Rate, instead of saying Feeding Habits, it will say Omnivorous, etc.). This chart is posted in front of the group without the characteristics and species labeled along the axes, but with the boxes blank. Based on the information provided in the first chart, the trainees can X in the boxes for the fish that "win" in each desirable characteristic category.
- For some characteristics, certain fish will tie, but when the chart is filled in for all categories the *O. niloticus* (and the *O. aureus*) will have more X's. The *O. niloticus* , according to some sources, grows slightly larger and reaches sexual maturity slightly later than *O. aureus*, though what will probably make the real difference between them is that *O. niloticus* is more widely available in many counties.
- The species that should be considered are the ones listed in the sample chart above (for the *Saratherodon* species, *S. melanotheron* could be used if more information is available), plus any other tilapiine species that are known to be common in the countries to which the trainees are assigned. In addition catfish and carp can be added.
- By the time this session takes place, trainees will have probably heard enough from visiting RPCV's and field staff, and from trainer panels, to have realized that *O. niloticus* is the fish most aquaculture programs promote. The reason for having the trainees go through the process described above is to let them see that there is a good reason for that choice. Even though they may realize in advance what fish they will probably end up selecting, it is important that they believe in the reason for this and not simply see it as dogma.
- The trainers should work closely with the trainee facilitators to help them understand the basic management plan that is to be presented. They will need to understand exactly why each step is important, exactly how the plan takes into account the characteristics of the fish, and exactly why they are being asked to present this plan as the foundation upon which other plans may be built, but for which there is no real replacement.

- The management scheme the trainees should present is as follows. It does not go into detail, and does not address many of the management steps that would be common in raising nearly any fish. The emphasis is on the points that are especially important because of the characteristics and problems with this particular fish.
    1. **Begin with a clean, dry pond.** (Reason: to be sure only the fish that are intentionally stocked are in the pond);
    2. **Stock young fingerlings of uniform size and age.** (Reason: a small fish is not necessarily a young fish. Since tilapia reproduce at a relatively young age, it is important to stock them young in order to get the most growth possible before sexual maturity is reached. By stocking fish at a uniform age, they are more likely to begin reproducing at approximately the same time. By stocking fish at a uniform size competition will be reduced and there is a better chance that fish will be of a uniform market size at harvest).
    3. **Feed and fertilize as much as possible!** (Reason: the objective is to maximize growth before sexual maturity is reached. You want the fish to grow as quickly as they can. Upper limits to this are determined by economics and water quality. The upper limits are not stressed as much as the idea of getting as much feed and fertilizer in the pond as possible because *O. niloticus* can tolerate very low oxygen levels, can utilize a plankton bloom, and is omnivorous so can be fed whatever is economically feasible. Practically speaking (especially in terms of aquaculture in developing countries), there is a much greater chance of someone not providing enough nutrients to maximize growth than there is of providing so many nutrients that water quality becomes limiting);
    4. **Harvest when the first generation of off-spring are large enough to withstand the stress of harvesting and handling.** If everything is done right from the very beginning (correct stocking rate was calculated, growth was calculated correctly, fish were fed and pond was fertilized sufficiently), fish will be market size and the pond will be near carrying capacity at the same time that this occurs. (Trainees should be able to list all three of these conditions that one hopes will coincide at the time of harvest and they should also realize that the first point - the one in bold print - is the most critical. Reason: once the fish reproduce, the pond will soon be out of the farmer's control given the nature of tilapia. Leaving the fish in longer is more likely to result in an overcrowded pond than in bigger fish, and the fingerlings will not be as good for restocking because, with several generations getting mixed together and stunted, it will not be possible to ensure that you are stocking young fish or that all fingerlings are the same age.)
    5. **Harvest the pond completely (put fingerlings to be restocked in a holding pond or tank), and let the pond dry completely before refilling and restocking.** (Reason: to be sure you get a clean start for the next cycle. Drying the pond is the one way to be sure there are no fry left in puddles and/or no brooders left alive in the mud).

- **Very important:** Before this management cycle is discussed with the trainees, the staff should go through it among themselves. Inevitably, staff members will not agree on every point of this cycle. For example, in Zaire volunteers teach farmers to wait until the second generation of fingerlings is viable before harvesting. Another argument might be that if very large fish are required to meet market demands, this plan might not work. Granted, one could argue for many variations on this theme. The point is to provide the trainees with the most basic, most simple plan, given the nature of the fish with which they will be working, that will permit a farmer to succeed in raising them. If the trainees thoroughly understand this foundation and the reasons for each step, they will easily be able to deal with designing variations, based on sound reasoning, to meet the demands of specific situations. If they do not understand this foundation, they will more easily fall into sloppy management, fall for glamorous but usually unfeasible higher-tech approaches to dealing with problems related to reproduction, or will be less likely to uphold the strict standards that many programs are trying to institute. While there are options, there is no replacement for basic good management.

If staff members do not all agree, they should hash it out among themselves before this is ever discussed with the trainees. Once the trainees become involved, the staff must be consistent in supporting what the trainee facilitators present.

- Trainees will be required to demonstrate a thorough understanding of this plan, and of the reasoning behind it, at their final interviews. Although this fact should not be completely spelled out for them (regarding the final interview), it should be made clear to the trainee facilitators that every trainee is responsible for knowing and understanding the plan. They should have, and should project to the group, a strong sense of the importance of this presentation.
- In order to make the presentation as memorable as possible and to reinforce its importance, the facilitators should be encouraged to be creative in designing their session, and dynamic in presenting it. Use of humor, good visual aids, role plays and/or other extension techniques are appropriate. The presentation must be tight enough to fit into the allotted time, but it should have impact.
- This session takes place after the Levels of Intensity Assignment Wrap-Up. The order in which these two sessions are presented is another point that could be argued. In this program, both ways were tried. The reason one might argue that the Levels Wrap-Up should come after this session is that this session presents a foundation while that one takes it a step further to explore more complicated approaches. This makes sense, but it is recommended that the sessions be presented in the order shown here (this session after the Levels Wrap-Up) in order to end with the basic foundation that trainees absolutely must understand to complete the program.

Session IX-13: Final Harvests

Time frame: ***Variable for each trainee. Entire process should occur over approximately three to four days.***

Objectives:

- Provide opportunity for each trainee to carry out all steps of a complete harvest in his/her pond;
- Provide opportunity for trainees to collect data and learn the results of their efforts as fish farmers;
- Provide fish for marketing and for the fish fry.

Overview: Trainees stocked their ponds and managed them throughout the training program. They now have an opportunity to complete their management cycles by completing harvesting their ponds. They will be able to learn the results of their efforts, assess their success as fish farmers and evaluate their own management techniques and decisions. The following is not a session design, but is a set of trainer notes.

1. Trainees should be notified of the date on which final harvests may begin, and the date by which they should be completed. In determining these dates, staff should keep in mind that trainees should be able to keep the fish in their ponds for as long as possible, but harvests must be also be completed early enough to allow time for writing and evaluating final reports.

2. Staff members should select one or two trainees with good organizational abilities to coordinate the final harvests. One trainer should also be designated as the staff supervisor of this activity. This trainer should work closely with the trainee coordinator, and it is the trainee coordinator who should actually communicate with the group.

3. Trainees may work in teams for the final harvests in terms of helping each other with the labor and sharing equipment, but each trainee is responsible for his/her own harvest, for all planning, all decisions, and for collecting all data.

4. The responsibilities of the trainer coordinator(s) include the following:
   - Setting the harvest schedule for all trainees. It is his/her decision whether or not trainees may sign up for certain time slots whether times will be assigned (though special needs of trainees who are serving as coordinators on other projects, who have ponds or fish that pose unique harvesting problems, etc. should be taken into account).
   - Organizing the teams. Again, it is up to the coordinator(s) to either assign them or allow trainees to have input.
   - Explaining any rules, guidelines, limitations, etc. regarding how teams work together, how equipment is to be shared, etc. This includes rules set by the staff and rules set by the coordinator(s).
   - **Very important:** Keeping track of all fish movements and inventory of storage ponds. At the end of the harvests, the coordinator(s) must provide the trainer in charge with a detailed, accurate account of exactly what is in each pond (i.e.,

  numbers of fish, size range and average weights, total weights, age, species, and what pond(s) they came from). They will receive instructions from the trainer in charge regarding what is required by the staff. (See next Trainer Note).
  - Working with Fish Fry and Fish Marketing coordinators to supply fish as needed for those events from the harvests.

- The trainer supervisor must provide all of the information to the coordinator(s) that they will need to do their job efficiently, and should provide support as needed. Examples of the kind of information to be provided includes:
  - When harvests may begin and the date and time by which they must be completed
  - Which ponds may be used as storage ponds
  - What holding facilities are or are not available (if appropriate), such as holding tanks, cages, etc.
  - Staff needs regarding how fish are stored; for example, staff may ask that fish be graded and stocked so that each storage pond contains only fish in a specified size range, that the fish be divided by age, that different species be stocked separately, etc.
  - All staff determined rules, limitations, etc. regarding how teams may work together, use of certain equipment, availability of vehicle for transporting fish, etc.

- The first ponds to be harvested will be the ones containing fish that are to be used for the Fish Fry and the Fish Marketing project. Please see design for Fish Marketing in this chapter. See design for Fish Fry in Chapter Fourteen.

Session IX-14: Fish Marketing

Total time: 15 hours

Objectives:

- Gain experience doing a marketing plan;
- Use a variety of methods of product promotion;
- Gain experience in all phases of actually marketing fish;
- Reinforce concept of profit incentive and strengthen trainees' convictions in aquaculture as a form of farming for income.

Overview: This exercise takes place near the end of the program. Trainees actually market the fish from their own ponds. They are responsible for all aspects from identifying the market, determining the best market size range, doing the promotion, transporting the fish to the point of sale and actually selling the fish. Selling the fish that they have produced gives the trainees a sense of accomplishment and purpose, as well as demonstrating the economic feasibility of fish farming.

3 hours

1. Preparations should begin at least a week in advance of the selling date. In order to determine size preference, local prices and other important information about the local market situation, trainees visit grocery stores, fish markets, restaurants, etc. They may also do research by telephone, contacting live haulers or processing plants.

5 hours

2. Once the date, price and location of the fish sale has been determined, trainees begin product promotion through whatever means are suitable, i.e. newspaper ads, radio ads, signs, flyers, phone calls, etc. Staff may need to provide transportation for distribution of flyers and/or putting up signs.

6 hours (depending upon supply of fish, location of sale, briskness of sales)

3. On day of sale, trainees must be very well organized to coordinate the following activities efficiently:
   - Set up transport equipment (may do in advance)
   - Harvest fish (may do this the day before and hold fish alive in tanks or cages)
   - Prepare point of sale, set up for sales (have cash box with change, plastic bags or other containers, dip nets, scales, displays and/or signs, holding facility for fish, etc.)
   - Transport fish to point of sale
   - Weigh (and/or count) and sell fish.

1 hour

4. The day following the fish marketing, trainee coordinators facilitate a group discussion to review the entire marketing process, critique their own work and draw conclusions that include a list of points they want to remember for their next marketing experience.

Materials and Resources:

- Fish of marketable size
- Access to local information sources such as fish markets,grocery stores, commercial fishermen, live haulers, etc.
- Access to newspapers, radio, television or whatever appropriate means of advertising are available
- Poster board, plywood, nails, boards, markers, paint,stencils, etc. (for making signs)
- Paper, rulers, markers, computer and/or xerox machine(for making flyers)
- Seines, dip nets, buckets, tubs, scales, measuring boards for harvesting fish
- Truck, transport tank, aerators, holding tanks, ice, salt and/or other equipment and facilities for transporting fish if necessary and for holding fish (alive) during sale
- Tables, chairs, money box, change, calculator, scales and tripod, plastic bags, dip net,etc. for point of sale.

Trainer Notes:

- Three or four trainees should be assigned as coordinators of this project. They delegate duties to other trainees, generally through forming committees.
- One trainer should be assigned to be in charge of this exercise. Trainee coordinators should work only with this trainer to avoid confusion and inefficiency. The trainer should communicate only with the trainee coordinators and should not undermine their authority with the rest of the group.
- The trainer provides logistical support, obtains all requested materials, helps trainees make contact with resources, etc.
- **Caution:** Staff must take care to learn about any legal issues, social customs, local etiquette, etc. regarding selling fish. There may be required permits and/or certain restrictions for selling fish directly to the public, to a restaurant, live or processed, etc. In addition, the exercise should serve as positive public relations and not a cause of bad feelings due to competing with or undercutting local merchants or fishermen. There may also be rules regarding putting up signs or distribution of flyers.
- To avoid administrative problems or misunderstanding on the part of the trainees, staff will need to determine in advance what will be done with the money from the fish sale. Be sure trainees understand whether or not they will have any input into how the money is used.
- Depending upon the circumstances, certain aspects of the marketing plan such as price setting or location of the sale may need to be dictated by the staff. However, the trainees should be given as much responsibility and freedom as possible.
- To avoid any potential health problems, all fish should be sold live.
- Although there are many ways to sell fish (to restaurants, supermarkets, live haulers, processors), it is recommended that trainees have the opportunity to sell at least some of the fish directly to the public.
- If customers are likely to be driving vehicles when they come to purchase fish, be sure that the point of sale has convenient parking areas and will not cause any problem for traffic passing by.

CHAPTER NINETEEN

PROGRAM DESIGN - WEEK TEN

Session X-1: Culture Shock

Total time: 1 hour, 40 minutes

Note: This session design is adapted from Session T-108 from the **Small-Scale Marine Fisheries Training Manual**, available from ICE.

Objectives:
- Identify different stages of culture shock;
- Begin to develop strategies for coping with culture shock;
- Share trainers' experiences with trainees.

Overview: As the end of training draws near, some trainees may already be experiencing some nervous anticipation about adjusting to their country of assignment. If this program has been conducted Stateside, they are preparing to depart to their countries and begin language training. If they are already in their country of assignment this session may be held earlier, or may be held at this point as trainees prepare to leave the familiar training environment to go to their posts. The most valuable aspect of this session is the time trainees spend in small groups, discussing their feelings and expectations about culture shock and sharing ideas for coping with it.

5 minutes
1. The trainer introduces the session, lists the objectives of the session, and presents a flow chart of the culture shock process.

40 minutes
2. The trainer tells the trainees how they will be dividing into smaller groups. They are told that they will be in their groups for 40 minutes. They should use their time in approximately the following manner to discuss the topics listed here (have this on newsprint):
- 10 minutes: Ways to cope with problems in stage two
- 5 minutes: Additional feelings that may be generated in stage three
- 10 minutes: Additional reactions that may occur in stage four
- 10 minutes: Hopes and fears regarding their experience with culture shock, how they cope, and their ability to adjust to the new culture
- 5 minutes: Prepare a short statement that summarizes the group's discussion.

The trainer tells the trainees that one group should write their ideas on newsprint for each of the first four topics (assign these, i.e. Group 1 records ways to cope, Group 2 records additional feelings, etc.), and each group should prepare a summary statement.Each group will need to choose a recorder and a spokes-person to present the group's list and statement.

30 minutes
3. Each group presents their list and statement, and highlights the most important points from their small group discussion.

5 minutes
4. The trainer summarizes the points that have been made during the presentations.

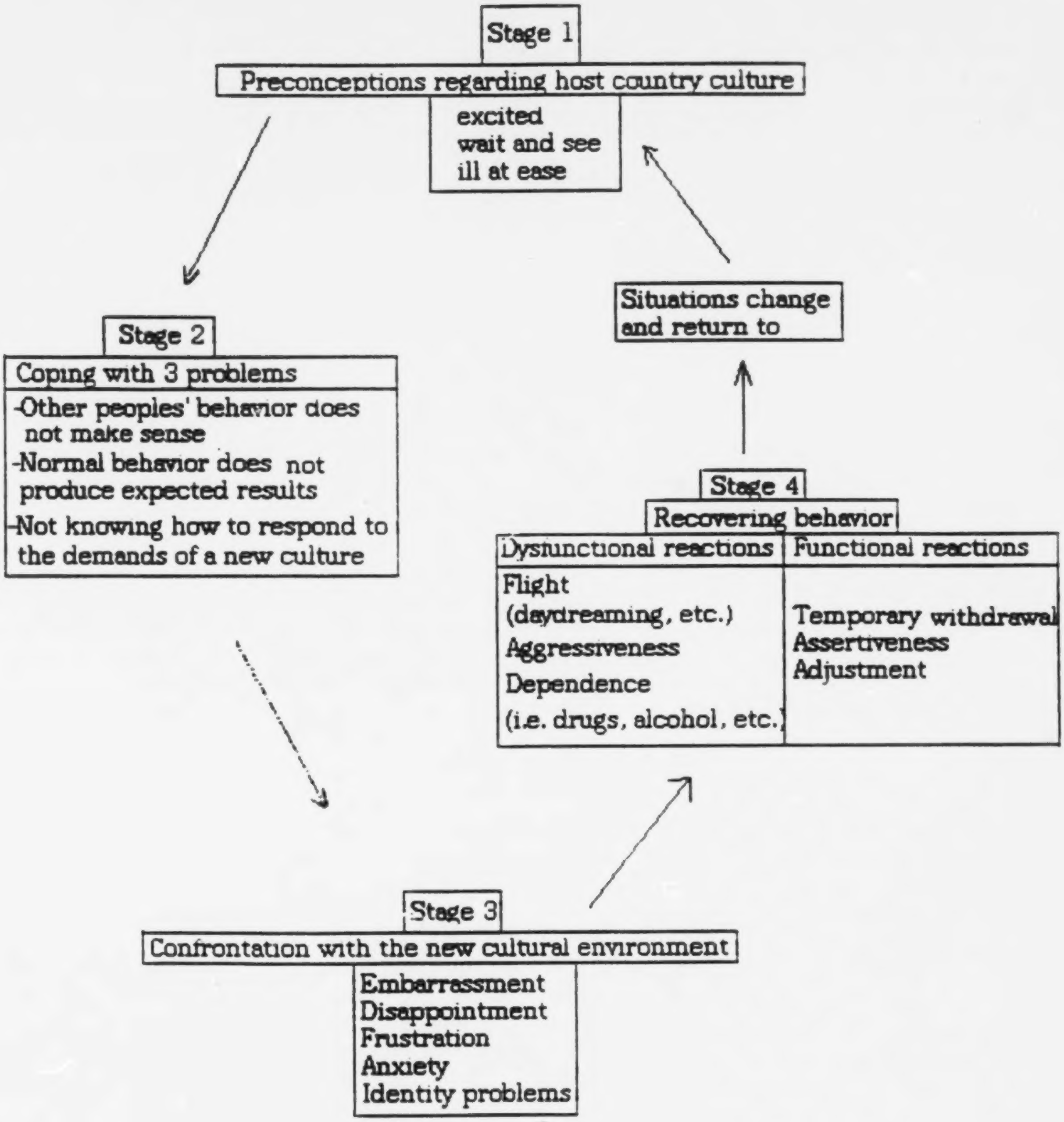
20 minutes
5. Several members of the staff share their own experiences that are appropriate to the points that have been raised.

Resources and Materials:

- Prepared newsprint with session objectives, flow chart (see example below), and time frames and topics for step number two above.
- Blank newsprint, markers, masking tape.

Trainer Notes:

- As trainees present their lists, staff members should jot down notes about points that especially touch them and about which they have experiences to share.
- Everyone (staff and/or trainees) may not agree completely with the way the flow chart presented here breaks down the steps of culture shock. That is not really an important issue, as of course each experience is unique and people react in different ways. The most valuable aspects of this session are the sharing of ideas and feelings that takes place among the trainees, and that trainees take some time to acknowledge and focus on the fact that they will probably have some sort of culture shock experience to contend with as they adjust to a new situation. The flow chart provides excellent food for thought and brings up important issues that will stimulate the trainees' thoughts and discussions.
- The Master Trainer should point out that giving this matter some thought in advance will not prevent the feelings and reactions from arising, but may make it easier to understand and cope with whatever the trainee does experience.
- An example of a flow chart follows:


Stage 1
Preconceptions regarding host country culture
excited
wait and see
ill at ease
Stage 2
Coping with 3 problems
-Other peoples' behavior does not make sense
-Normal behavior does not produce expected results
-Not knowing how to respond to the demands of a new culture
Stage 3
Confrontation with the new cultural environment
Embarrassment
Disappointment
Frustration
Anxiety
Identity problems
Stage 4
Recovering behavior
Dysfunctional reactions
Functional reactions
Flight
(daydreaming, etc.)
Aggressiveness
Dependence
(i.e. drugs, alcohol, etc.)
Temporary withdrawal
Assertiveness
Adjustment
Situations change
and return to

Session X-2: Processing of Pond Construction Project (and Wheelbarrows)

Total time: Approximately 2 hours

Note: If wheelbarrows were constructed early in the program they may have been processed as part of the Masonry Processing. If this is the case, but wheelbarrows were used during the pond construction project, it may be worth evaluating the designs again in this meeting in light of this field testing. It is also possible that the carpentry project was included as part of the masonry project and wheelbarrows were not constructed at all. The session design presented here is for the Pond Construction project. Essentially the same kind of process takes place for evaluating the wheelbarrow project. Having had the opportunity to field test the wheelbarrows during the construction project, trainees have an excellent opportunity to make a detailed, valuable assessment of the designs they used and determine improvements to be incorporated into future designs.

Objectives:

- Provide opportunity for group leaders to bring the project(s) to a formal conclusion;
- Review steps followed throughout the project(s) and fill in gaps that individuals may have in their notes;
- Provide opportunity for trainees to critique their work, identify strong and weak points from both technical and organizational standpoints;
- Reinforce technical learnings and clarify points of confusion as necessary.

Overview: The construction project involves many steps and is completed over a period of time. During that time, some trainees may be more involved in some steps than in others and may need to learn more details about the steps in which they were less involved. In addition, it is important to take time to assess the final product as well as the steps of the process used to achieve that product in order to identify strong and weak points, problems and solutions, etc. and draw conclusions that may be applied next time trainees oversee a pond construction project. This meeting is facilitated by the group leaders for the construction project. Near the end of the meeting, the trainer who was in charge of this project also offers his/her input.

1. The trainee coordinators facilitate a discussion of the project. This should take place mainly in the classroom in order to ensure that everyone can hear, see and participate, but should also include a walk out to the actual project site in order to look at the completed pond. This may occur at the beginning or at the end as the group leaders see fit, but if it occurs at the beginning, they should point out specific things the trainees should look at and be prepared to discuss.

2. The trainee facilitators should begin the session with a review of the entire project, chronologically, from beginning to end. The discussion should address:

- What actually occurred at each step (including site selection considerations, surveying, staking out the pond, scarifying, digging and construction of cores, consruction of dikes, tamping dikes, sloping pond bottom, balance of cut and fill, placement and construction of drainage, inlet and overflow structures, finishing touches, sealing, erosion control, etc.).

- What worked well, what didn't work well for each aspect.
- Suggestions for alternative or improved techniques, solutions or approaches - including both technical and extension aspects.
- Special problems or difficulties encountered, solutions tried or recommended.
- Results: condition of finished pond, what caused any unanticipated results.
- Economics: materials and tools used, costs of construction, total time and labor, efficiency regarding costs and labor.
- Analysis of group organization aspect: effectiveness of group coordinators, unique aspects of being a leader, unique aspects of being a group member not in the leadership role, how well group worked together, problems encountered, what helped, what people learned about themselves, what people learned about group projects, changes and improvements since last group project based on experience from that project.

The discussion should involved a lot of group discussion, sharing of ideas, asking and answering of questions.

3. Near the end of the session, the trainee group coordinators should ask the trainer in charge for input. The trainer should provide insights and observations, constructive criticisms, reinforcement of positive aspects, and suggestions. He/she should share some personal experiences and ideas, and give any helpful hints or techniques he/she may be able to provide.

4. The trainer should ask the trainees to spend ten minutes or so listing important points that came up during the discussion that they want to be sure to remember for next time they are involved in a pond construction project, and/or a group project of any kind as either a leader or participant.

5. In concluding, the trainer should congratulate the group on the project and on the discussion, as appropriate, and should thank the group coordinators.

Resources and Materials:

- Blackboard, chalk, eraser (in case trainees want to illustrate points or ideas, or if group leaders want to put up an outline for the discussion
- Other materials group leaders may request (newsprint and markers, etc.).

Trainer Notes:

- The trainer in charge of this project should meet with the group coordinators well in advance of this session. They should be given ample time to prepare, and the trainer should provide suggestions for ensuring that the issues listed in step number two (above) are addressed. He/she should ask the group leaders to allow time at the end for him/her to share some observations with the group. It is also a good idea to encourage the group leaders to take the initiative in critiquing their own leadership in the project, and encourage them to prepare themselves for both giving and receiving feedback in a constructive manner.

- The trainer in charge of this project should also be well prepared. He/she should have been taking careful notes throughout the project in order to be able to provide good, accurate, useful input regarding observations made as trainees worked through all of the steps, as well as technical points that may have been overlooked, not clearly understood, or that can be offered to supplement the knowledge the trainees have. The trainer's input should also be provided in a constructive, positive and helpful manner.
- This project provides a perfect opportunity for trainees to feel a real sense of accomplishment. There will probably have been errors made, but if the errors serve to enhance the trainees' learning, then they will have been worthwhile. If the group tends to be very hard on themselves, the trainer should make a point of helping them put their errors into perspective. He/she should try to help the trainees recognize both their accomplishments and the new knowledge they obtained through the project.

Session X-3: Final Interviews

***Time frame:** Very variable. Approximately 45 minutes per trainee.*

Objectives:

- Review the trainee's analysis, final conclusions and most significant learnings regarding the management of his/her pond;
- Review and reinforce the most basic, essential elements of good management for *Oreochromis niloticus*, and ensure that the basic management plan is clear and fresh in the trainee's mind as he/she departs for his/her country of assignment;
- Acknowledge each trainee's efforts and accomplishments over the course of training, and bring his/her technical training to a formal close;
- Express the staff's congratulations to each trainee upon successful completion of the program.

Overview: Final Interviews are not at all like previous personal interviews. They are very formal, and both the content and format are different. There are a series of steps that take place in the final interview that address both technical and non-technical issues.

1. The Project Director welcomes the trainee to the interview and explains that the interview will be comprised of several parts.

10-15 minutes

2. The trainer who worked with the trainee's reports throughout the program has the trainee's final report in hand. He/she asks the trainee a series of questions about some of the more significant issues raised in the report these may include unique approaches to management, techniques the trainee developed, special problems that were encountered, interpretations made by the trainee in his/her analysis, etc. The other staff members who are present may choose to ask follow-up questions as the discussion progresses. In concluding this part of the interview, the trainer who evaluated the report acknowledges the effort the trainee put into the management of the pond and into the preparation of the report, congratulates the trainee on the quality of the report (if appropriate), and returns it to the trainee. Finally, it is pointed out that the report is an important and informative document, and the trainees is encouraged to keep it so that he/she may refer to it in the future.

5-20 minutes

3. For the next part of the interview, another trainer asks the trainee to tell the staff what fish would be considered the culture species of choice for most warm water aquaculture situations. (The trainee is expected to give *Oreochromis niloticus* as a reply).

The same trainer then asks the trainee to describe the most basic, simple management plan that could be used to raise *O. niloticus* successfully. The trainee is told to emphasize the points that are especially important in light of the characteristics of this fish. (In reply, the trainee should describe the management scheme that was presented in the special technical session on a "Basic Management Strategy for *O. niloticus*").

5 minutes

4. The Project Director (or Project Manager) asks the trainee to reflect back over the past ten weeks of training and to express what he/she considers to be his/her most significant accomplishment.

5 minutes
5. The Master Trainer provides any final feedback to the trainee, and acknowledges the progress that the trainee has made over the course of training. (The Master Trainer may choose to include some observations from the staff's point of view regarding the trainee's own comments regarding his/her most significant accomplishment).

5 minutes
6. The last part of the interview is the reading of the trainee's final evaluation. The Project Director explains that the staff has prepared a written final evaluation of each trainee that will be provided to the in-country staff. The purpose of the written evaluation is explained, and the Project Director reads it to the trainee.

7. After the evaluation has been read, the Project Director congratulates the trainee on his/her successful completion of the program. The rest of the staff also congratulates the trainee, and the interview is completed.

Resources and Materials:

- Comfortable, private meeting area with ample seating for up to six people
- Trainee's final report: the trainer who read it should have it at the interview
- A written evaluation of the trainee, prepared by the staff for the in-country staff
- Any notes that the staff has prepared regarding comments to be made in part 5 above

Trainer Notes:

- Final interviews should be quite formal. Staff members should dress appropriately, and the interview should be held in a clean, comfortable, private location.
- At a minimum, the Master Trainer and two other trainers should be present in the interview. One of the two trainers is the one who worked with the trainee's reports throughout the program. Any other available trainers should also be present - this is an important moment and it would be ideal to have all trainers present to lend support in the interview, recognize the trainee's accomplishment and offer congratulations on completion of the program. Unfortunately, this is often not feasible since staff members are usually very busy evaluating final reports. In addition to the Master Trainer and the two trainers who must be present, the Project Director should be present, if possible. In the case of a stateside training program, it is advisable to have a Peace Corps/Washington staff member, preferably the project manager, present. For an in-country program, the appropriate APCD should be present.
- For the first part of the interview, the discussion of the trainee's final report, the trainer who read it can brief the rest of the staff quickly about unique aspects of the trainee's pond management, highlights of the report, and the questions he/she plans to ask the trainee. During this part of the interview, the staff should pay attention to the time. It is possible to get so involved in the discussion that twenty or thirty minutes can pass,

and it is very easy to get backlogged on the interviews. On the other hand, this part should not be rushed or off-handed; the staff should show interest in the trainee's pond work and report.

- For the second part of the interview, described in step number three above, trainees should not have any problem answering the questions. However, there are exceptions to this. In some cases, it may take a few moments for the trainee to "click in" to the management plan that was presented in the earlier session. The trainee may be very nervous and have a lapse of memory, or may go into a very detailed plan rather than describe the concise version. To help get the point across, the question regarding the management plan can be posed in the form of a hypothetical scenario that makes it clear the description should be concise. An example of a scenario used in past programs follows:

  > Imagine you are at J.F.K. airport waiting to board your flight to go overseas. You and the other trainees are having a lively discussion about O. niloticus, and you notice a gentleman has been moving closer to your group and appears to be listening to your discussion. Suddenly, he gets up, comes over to you and says "Excuse me, but I couldn't help overhearing that you were talking about O. niloticus. I have been raising catfish for years, but I've been hearing a lot about this O. niloticus lately and I'm interested in trying to raise them." Just then, your flight is called over the intercom and you have one minute before you must board your plane. In that one minute, tell this farmer the most basic, simple plan he could follow to raise O. niloticus. Since he already has some aquaculture experience, be sure you emphasize the points that are especially important in light of the characteristics and potential problems with this particular fish.

- If a trainee is unable to answer either or both of the questions in this second part of the interview, the staff must use their judgement about how to handle it. Sometimes, a few follow up questions from the staff will trigger the trainee's memory and he/she will be able to proceed. Another recommendation is to ask whether the trainee remembers discussing these issues before. If the response is yes, the staff may stop the interview, ask the trainee to go review his/her notes and collect his/her thoughts, and set a time to resume the interview.
- As mentioned in the notes on the Personal Interview in Week Nine, the feedback that is provided during part five of the final interview should emphasize the positive. There should be no unpleasant surprises in the final interview, and except for very special circumstances, this part of the interview should serve to emphasize the trainee's strengths and achievements, and boost his/her confidence. Difficult or sensitive areas should have been discussed at the Week Nine interview.

Session X-4: Final Trainee Evaluation of Training Program

Objective: Provide staff with feedback from trainees that can be used to evaluate the program and improve future programs.

Overview: Each trainee is asked to fill out an evaluation form similar to the ones they completed on a biweekly basis through most of the program. These are collected at the final interviews and are very useful to staff for evaluating their own performance and effectiveness, and for improving planned activities, session designs, training techniques and logistics. Following is a trainer note and a sample of a form used in past programs.

Trainer notes:

- With so much going on at the end of the program, it can be difficult to ensure that each trainee receives a form and that a completed form is collected from everyone. One system that worked fairly well was for the trainers to give an evaluation form to each trainee when notifying that individual that his/her final report was accepted. At this point, the trainee will no longer be distracted and under pressure (since the final report is completed), and should be able to give time and attention to filling out the form thoughtfully. The trainer asks each trainee to bring the completed form to the final interview, but should point out that the form will not be collected until the interview is completed. Another alternative is to give out the forms at the final interview and ask that they be turned in at the final dinner, but, based on experience in this program, this seems less likely to result in all forms being returned.
- An example of a final evaluation form follows:

FINAL EVALUATION OF TRAINING

Name: ______________________________

Country: ____________________________

Date: ___________________

1. Please rate the following training activities on a scale of 1 to 5.(1=not valuable, 5=very valuable):

Orientation Sessions (first two days of program)	1	2	3	4	5
Set of pond management plans (stocking, feeding, etc.)	1	2	3	4	5
Management of your own pond1	1	2	3	4	5
Masonry/Carpentry exercise	1	2	3	4	5
Seminars	1	2	3	4	5
Resource people	1	2	3	4	5
Long field trip	1	2	3	4	5
Site selection/pond design exercises	1	2	3	4	5
Trainer Panels	1	2	3	4	5
Pond Construction Exercise	1	2	3	4	5
Final Pond Report preparation	1	2	3	4	5
Personal Interviews	1	2	3	4	5

Additional comments (especially on activities you rated particularly high or low):

2. Please rate the training program staff on the following (1=low, 5=high):

Technical competence	1	2	3	4	5
Commitment to Peace Corps Aquaculture	1	2	3	4	5
Professionalism	1	2	3	4	5
Concern for your personal progress	1	2	3	4	5
General attitude	1	2	3	4	5
Effectiveness as trainers	1	2	3	4	5

Comments:

3. Please make any comments you may have regarding the suitability of the training facilities.

4. Please rate your skill levels in the following areas compared to ten weeks ago on a scale of 1 to 5 (1=no improvement, 5=excellent improvement):

Pond site selection/surveying	1	2	3	4	5
Pond construction	1	2	3	4	5
Water quality	1	2	3	4	5
Fertilization	1	2	3	4	5
Feeding	1	2	3	4	5
Stocking rates	1	2	3	4	5
Fish handling	1	2	3	4	5
Harvesting	1	2	3	4	5
Extension methods	1	2	3	4	5
Economics and marketing	1	2	3	4	5
Report writing	1	2	3	4	5
Speaking in front of groups	1	2	3	4	5
Problem solving	1	2	3	4	5
Interviewing	1	2	3	4	5
Planning/goal setting	1	2	3	4	5

Comments:

5. Please make any general comments you may have on the training program and the impact it has had on your understanding of fish culture, the role of the volunteer, your self-confidence, commitment to Peace Corps and fisheries program, motivation, etc.

CHAPTER TWENTY

PROGRAM EVALUATION

A training program does not have a life of its own, it exists to prepare participants for their role in achieving an agency's or project's goals. As objectives are achieved and conditions shift towards new priorities, modifications in preparation are appropriate. Thus, the effectiveness of a training program must be measured in how it is addressing the contemporary needs of the agency or project. However effective a training program has been historically, it cannot afford to defend "sacred cows" but instead it must be flexible enough to change with the times, but, it cannot be so flaccid as to lose needed backbone or continuity in addressing certain basic needs for preparation of its participants.

Evaluation of a training program must be accomplished in order to examine its effectiveness in preparing the participants for their future responsibilities. Self-examination can be conscientiously done so as to suggest appropriate program modification, thus, the program evolves rather than suffering from intermittent, major overhauls. To be effective, however, the evaluation process must incorporate input from a variety of sources (i.e., trainees, Peace Corps/Washington and field staff, past participants, returned Volunteers and training program staff) over a period of time. The training program described in this manual has been influenced by such a process. The program has been sensitive and responsive to scrutiny and constructive criticism.

Trainees/Volunteers/Returned Volunteers:
Just as trainees receive feedback from the staff, they must also have the opportunity to provide feedback and express their feelings about the training program and the staff. This two-way flow of feedback and ideas helps everyone involved and promotes an atmosphere of trust and mutual respect. Feedback from trainees is very helpful to the staff in learning about the effectiveness of their training techniques and methods, the strengths and weaknesses of the site and logistical support, the degree to which they are being successful in setting an example for the trainees, and obtaining suggestions for improving all aspects of the program. There are a few channels through which trainees can evaluate the training program. If the atmosphere in training is as it should be, there should be enough trust and honesty for the trainees to feel comfortable expressing themselves. Approximately every two weeks, a written evaluation instrument is distributed for the trainees to fill out and return (samples are provided in the Program Design chapters). They may put their names on these or submit them anonymously. In addition, staff should point out to the trainees that they are welcome to discuss any thoughts or concerns verbally with any staff member at any time, whether informally, in a scheduled interview, or in a special interview that can be arranged upon request. Staff should take care to respond appropriately to input from trainees. Defensiveness is counter-productive, and it is imperative that staff maintain their objectivity with all trainees regardless of input they may receive from them. The degree to which staff explains or discusses points raised by trainees about the program is up to their discretion, but all feedback should be acknowledged and appreciation should be expressed for all input offered by trainees.

In addition to the formal feedback process described above, daily classroom sessions provide a mechanism to obtain on-going information which indicates a response to training. However, this must be tempered with the trainees' perspective on the rationale behind training at that point in time. In effect, the trainees are so close to the process, it is difficult to be objective. Nevertheless, their input is valuable and training program staff should scrutinize suggestions thoroughly.

It may also prove valuable to conduct a group question and answer, and feedback session part way through training. The exact timing of the session should be based on the general atmosphere of the particular training program. If it appears that trainees are generally feeling negative about training, this session should be held as early as possible. In this way, problems will be alleviated early, thus assuring a better response to training. In past programs, this session has been facilitated by someone who is not directly connected with the training program such as a Peace Corps/Washington staff member.

It is also advisable to request the trainees complete a questionnaire on technical training at the end of ICT, after six months of service, after one year of service and at completion of service. Input from returned Volunteers is also valuable but difficult to obtain. Their perspective of training at these times may be less biased than earlier assessments and should be more useful in developing constructive program modifications. Due to changes in contractors and other considerations, the later evaluations may need to be conducted by Peace Corps rather than by the training contractor.

Training Program Staff:
This phase of assessment should be initiated as part of staff training and carries through to the end of the cycle. Returned Volunteers who participate as trainers should be asked to comment on their own training in relation to their overseas experience. This provides a basis for discussing the philosophy of the contemporary training program from their perspective as a new staff person. Trainers are an integral component for trainee feedback during the program and, therefore, must understand their new staff role. This critical aspect is accomplished by a thorough staff training.

In addition, regular staff meetings should include an on-going assessment of the program's effectiveness. The staff should meet at least weekly to discuss activities and problem resolution. Trainers should also be asked to provide an overall assessment at the end of the cycle through questionnaires and a direct request from the Program Director.

Peace Corps Staff:
Visitors to the training program should be encouraged to offer suggestions in relation to their orientation. In addition, questionnaires should be sent to field staff in countries to which trainees were assigned.

CHAPTER TWENTY-ONE

RECOMMENDATIONS FOR IN-COUNTRY TRAINING

Full In-country Technical training:

- As is always the case when the site and staff for the training program changes, modifications must be made in order to accommodate the circumstances. This is true when stateside programs change locations, and is equally true when the program goes from a stateside to an in-country situation. Without addressing a specific site and its specific circumstances, it is difficult to make recommendations regarding the exact adjustments that need to be made. However, it should be emphasized that even though the specifics will vary as a program is adjusted to any new location and staff, the basic design, the material that is covered, the emphasis on the development of a wide variety of technical and personal skills, and the high standards that have always been maintained in fisheries training should not and need not change.

- Sometimes the argument is made that it is a waste of time to teach trainees about techniques or levels of technology that they will probably never see or apply in their country of assignment. If this philosophy becomes the basis for a training program, the trainees and the host country will lose something very valuable. The most important basic premises of aquaculture training have always been the strong emphasis on skill development, provision of a very broad base of knowledge and experience, development of a sound understanding of technical concepts and principles (not just facts), and development of trainees' confidence. The goal is to prepare trainees to deal competently with any technical situation, problem or challenge and to have a deep enough understanding to be self-reliant and make responsible, solid decisions. This is different from simply teaching a person how to accomplish a series of tasks within one specific set of circumstances. Trainees have had opportunities to envision what the possibilities are in aquaculture, to see how an aquaculture industry can develop and how it can provide a livelihood for people. This kind of vision allows the trainees to see what they are doing in a broader perspective and can greatly increase their enthusiasm and sense of commitment. They are able to approach their work and make decisions with thought for the long-term ramifications and a consideration for what those decisions will mean in the context of an ongoing process of development. The approach described here should not be sacrificed if training is to be conducted in-country. There is sometimes a tendency to think that since some of the higher-technology practices and equipment are not readily available, that trainees' learning must be brought down to a lower level, covering just the bare bones. This is not true. With hard work and creativity on the part of the training staff, the same philosophy and essential practices can be applied to in-country training as have been applied to stateside training in Oklahoma and South Carolina, even though many of the specifics will be different and modifications must be made.

- Advantage should be taken of the opportunities provided by in-country training, such as the availability of a wide variety of local feeds, fertilizers, various tilapiine species (trainees should learn to identify them), etc. There are opportunities for trainees to practice extension in a situation that will motivate them because they see the direct application even more clearly than in stateside training. Site selection exercises are often easier to do in-country in that there is often access to better sites.

- On the other hand, do not let in-country training provide an excuse for limiting learning opportunities and resources. For example, just because it may be more difficult, perhaps even impossible, to provide pelleted feed for the training site along with local by-products used for feed by farmers in that area, it is still important for the trainees to learn about the existence of commercially produced pelleted feed and to understand the processes used to produce it. Just because host country fish farmers will not have access to Hach water quality test kits does not mean that trainees shouldn't use them during training to learn about the principles of water quality. By using these tools as trainees, they will be able to gain an understanding of what the various parameters mean, how they are interrelated, what causes changes in them, how they affect the fish, and so on. Once they have this knowledge, they can apply it in practical situations, be effective at trouble-shooting and help the farmers understand why they are being encouraged to practice certain management techniques even if they never see a Hach kit again during their service.

- The resources may be different, but there are probably many of them. Staff may find it more difficult to identify, locate and communicate with resource people, so all pre-training research should start early. It should be possible to arrange a field trip during in-country training as well. If there is little going on with aquaculture in that country, it may be possible to incorporate visits to fish farmers, hatcheries and any other aquaculture-related stops with an overview of some parallel industry that is somewhat more developed in that country (chickens, cacao, etc.). Logistics of a field trip in-country are certainly more challenging, so again, preparations should begin as early as possible and will probably require even more legwork than in stateside programs.

- Peace Corps Volunteers working in the fisheries programs in the country where training is being conducted can be excellent resources. Although the training schedule is too tight and too strict to allow for casual, unarranged visits at any time, a formally scheduled social event to which volunteers are invited would be a good idea. Also, individual fisheries volunteers can be invited to come serve as resources on specific topics. In this case, each invited volunteer should prepare a presentation before his/her visit on a topic that has been agreed upon by him/her and the training staff.

- Be cautious about letting the trainees get too distracted by the cross-culture aspects that are inherent in doing training in-country. Certainly, this cannot be ignored and trainees should receive some cross-cultural orientation soon after they arrive so that they can live and work effectively and courteously in the area. However, the main focus of this part of their training should be on developing their aquaculture and extension related skills, similar to stateside training. If an attempt is made to incorporate too many cross-culture activities, too much time and energy will be taken from their technical training. (This point assumes that trainees will receive further language and cross-culture training in a separate program after completing their technical training).

- While on the topic of cross-cultural aspects of in-country training, it is worth noting that this can raise new considerations regarding the implementation of training activities that are not quite as critical in stateside training. As trainees go through the learning process they will inevitably make some mistakes in their technical work. While major errors that result in high fish mortality, poorly built structures, damage, and waste are certainly never taken lightly, there is some leeway in a stateside program where the effects of errors are usually confined to the training site (except when work in being conducted with or for someone outside the program). In stateside programs, there must be an awareness of how the program and the people associated with it will fit in and/or impact on the local community. In in-country training, extra sensitivity is required. A Peace Corps training site in-country is normally much more high-profile than in a stateside situation, and the activities of the trainees are usually widely observed by people living in the local area. It is imperative to respect those people and be sensitive to them. Judgements that are already delicate in a stateside program become even more delicate. For example, the first time trainees harvest a pond, there is a good possibility that in at least one instance some fish will be lost down the drain before the trainees work out the timing for putting a net or screen across it. In a stateside program, the staff members observing this might choose to allow a few fish to escape before calling it to the trainees' attention so that the consequences of overlooking this important step will have maximum impact. In discussing the implications of those lost fish in terms of wasted food, the point would be very well reinforced and it is unlikely the trainees would make the mistake again. In a program that is taking place in a developing country, any waste of fish, even for the sake of learning, might be unacceptable.

- One advantage with some in-country training sites is that when trainees live, eat and work in the same area, a great deal of time will be saved in terms of logistics. If trainees can easily walk to their ponds at any time without being dependent upon training staff to provide transportation, they will be able to spend more time working with their fish and be better managers. They will have a greater sense of responsibility regarding their ponds because of their independence. With less time being spent in transport, there may even be enough time to do the masonry project early and leave time for a small pond construction project during Week Seven. All of this will need to be determined by the on-site staff.

In-country Technical Orientation (following stateside or regional technical training program):

- Request and act upon recommendations from technical training staff regarding areas that should be further reinforced or supplemented.

- The areas in which trainees usually feel the least confidence are site selection, pond design and pond construction. Site selection/pond design exercises should be conducted in the kind of terrain in which trainees will actually work once they go to their sites. If they have not constructed a pond during their technical training, they should absolutely have the opportunity to do so during their in-country technical orientation.

- Trainees should have an opportunity to learn about and see all local sources of feeds, fertilizers and other resources. They should be taught the local names for these items and where they can be obtained.

- Trainees should learn about the specific agricultural practices of farmers in the areas in which they will be working. They should be made familiar with local industries, by-products of those industries, and the history of how those industries have developed as well as their present status. They should be well informed about both cash crops and food crops being produced, consumed and marketed by the local farmers. They should learn about the economics of the area and about marketing strategies used for various products. They should observe prices of various foods and foodstuffs, and compare prices of similar products (similar in terms of what they provide nutritionally and/or in the way they are used. For example, chicken, fish, beef and pork are all similar in that they are protein sources). Attention should be given to opportunity costs. For example, how much could a farmer make in a given area using a given piece of land to produce fish rather than corn? They should learn enough about agricultural, economic and social activities and concerns to be able to put aquaculture into the context of the other aspects of people's lives.

- Trainees should have an opportunity to see and to learn to identify all major species of local freshwater fish that they are likely to encounter. This include species being cultured, species being caught in rivers and lakes, species found in markets, etc. They should learn about sources of culture fish, and especially about sources of *Oreochromis niloticus*.

- Another area in which trainees generally lack confidence and always need more practice is extension. Extension activities should be included in in-country orientation, and trainees should be given opportunities to get input from experienced volunteers.

- Although trainees generally feel more confident about pond management than they do about construction and extension, it is important that the importance and difficulty of promoting good pond management be stressed. It is easy for volunteers to get caught up in the tangible challenges posed by pond construction but to be less diligent about the more subtle area of pond management. This can happen for several reasons: progress is more difficult to detect so there is less, or less immediate, satisfaction, farmers can lull volunteers into a false sense of complacency by verbally implying that they are practicing better management than they really are, or there may be pressures on volunteers to report higher numbers of ponds being built. Trainees should be forewarned about this issue during in-country orientation and the importance of promoting good management should be reinforced.

- Trainees should be well informed about the programming and political aspects of aquaculture in their country of service. They should learn about the history of aquaculture in the country and about the history and goals of the existing fisheries program. It is important for them to understand the long-term plan for aquaculture development and to see exactly what their role is in that plan. They should learn about existing infrastructure. They should be well informed about how the fisheries program and related programs are administered, and have a clear understanding of organizational hierarchies, how different organizations interact, and especially where they will fit into the existing administrative structure. They should learn about required reports, i.e., formats, to whom and how often they are to be submitted, how they will be used, the flow of information, etc.

In-Service Training:

- Pre-service training provides trainees with the essential basic skills and knowledge they need to perform their jobs. However, as volunteers gain experience, they inevitably encounter problems and challenges that either could not have been foreseen or for which they could not have prepared themselves until experiencing the need. In addition, goals and perspective can become clouded by the difficulties and frustrations of day to day activities. Some volunteers may miss out on important job-related information or developments if they are isolated at their sites. It is imperative, therefore, that each country provide occasional in-service training over the course of each volunteer's service.

- The actual content to be covered during in-service training must be determined for each individual program and will depend upon the needs of the volunteers, the farmers and the programs. In-service training can address additional skill development in areas cited by the volunteers. It should certainly provide an opportunity for volunteers to discuss issues such as the goals and directions of the program, the goals and directions of their individual work, the problems they share or can help one another to solve. They should be encouraged to share techniques and ideas they find helpful for various technical and/or extension aspects of their work. Field staff can provide information and updates regarding programming issues, political issues, and communications with the ministries. They can provide and elicit feedback for the volunteers, themselves, Peace Corps and ministry officials. Some of this can be accomplished during periodic fisheries volunteer meetings. The key difference is the skill development which takes place with the help of outside expertise during in- service training.

Completion of Service:

- In training, much attention is given to the concept of the Experiential Learning Cycle. Life is actually comprised of series and layers of experiential learning cycles, and the two years of Peace Corps service can be viewed as one of those cycles. Thus, it is critical that volunteers approaching their completion of service have an opportunity to process and assess their experience. Again, the actual content of Completion of Service training must be developed on an individual basis for each program, and Peace Corps/Washington has a lot of information that can be helpful in designing the COS training.

- As already stated, Completion of Service training should serve as an opportunity to process the volunteers' Peace Corps experiences. They should have an opportunity to analyze the results of their work, and to explore the effects that their work will have on an individual level (the farmers with whom they worked), and within the context of the overall program both in the immediate sense and from a long-term perspective. They should be encouraged to focus on how they have been affected as individuals as well - personal skills and qualities they have developed, what they have learned about themselves, how they have benefited from their experience, etc.

- On a practical level in terms of the program and future volunteers who will serve in it, effort should be put into strengthening institutional memory. The experiences and contributions of each volunteer can be of value to the volunteers who will follow and work to keep the program moving forward. This can prevent errors from being repeated and ensure that successful techniques and ideas continue to be incorporated into the implementation of the program. Each volunteer should be required to leave a thorough, detailed final report that can be used by the volunteer(s) who follow. The reports will also be extremely valuable to the program administrators for helping them evaluate and analyze the progress of the program and update the design as needed. Along similar lines, field staff and other program administrators and policy-makers should listen carefully as COS'ing volunteers share their observations and recommendations.

- Finally, Completion of Service training should help prepare the volunteers for the immediate and long term future. The realities of readjustment should be addressed. Options and suggestions regarding future career planning should be included, and volunteers interested in continuing in the aquaculture field should be made aware of opportunities or contacts they could explore upon their return to the United States.

CHAPTER TWENTY-TWO

PUBLICATIONS, EQUIPMENT AND MATERIALS

Part One: Publications

The following is a list of books, reprints, and other written materials that were available to trainees at past programs. This list should not be considered to be complete since there are many additional relevant materials available. Many of these items are available through Information Collection and Exchange (I.C.E.) at Peace Corps/Washington. It is recommended that good texts on fish physiology and ichthyology be added.

Books, magazines, brochures, bulletins, other information:

Aquaculture Magazine (issues from past 10 years)
Catfish Farm Journal (issues from past 4 years)
Various authors: Assorted extension materials used by Peace Corps Volunteers
Attfield, Harlan D.: **Raising Rabbits**
Bagenal, Timothy ed.: **Methods for Assessment of Fish Production in Fresh Waters**
Balarin, John Dominic: **Tilapia: A Guide to Their Biology and Culture in Africa**
Bard, J. et. al.: **Manuel de la Pisciculture**
Bardach, John E., et. al.: **Aquaculture: The Farming and Husbandry of Freshwater and Marine Organisms**
Bardach, John E.: **Fish Behavior and Its Use in the Capture and Culture of Fishes**
Bazigos, G.P.: **Design of Fisheries Statistical Surveys - Inland Waters**
Belanger, Jerome D.: **The Homesteader's Handbook to Raising Small Livestock**
Benor, Daniel and J.Q. Harrison: **Agricultural Extension - The Training and Visit System**
Boserup, Ester: **Woman's Role in Economic Development**
Boyd, Claude E.: **Water Quality in Warm Water Fish Ponds**
Brown, E. Evan and John Gratzek: **Fish Farming Handbook**
Brown, Evan and John Gratzek: **World Fish Farming: Cultivation and Economics**
Buvinic, Mayra: **Women and World Development: An Annotated Bibliography**
Carnee, Michael: **Research-Extension-Farmer**
Chakroff, Marilyn: **Culture et Gestion d'Etangs a Poissons d'Eau Douce**
Chakroff, Marilyn: **Freshwater Fish Pond Culture and Management**
Chamberlain, G., et. al.: **Texas Shrimp Farming Manual: An Update on Current Technology**
Charlton, Sue Ellen M.: **Women in Third World Development**
Chaston, Ian: **Marketing in Fisheries and Aquaculture**
Chaston, Ian: **Business Management in Fisheries and Aquaculture**
Coche, A.G. and H. Van der Wal: **Water for Freshwater Fish Culture**
Coche, A. G., et. al.: **Common Carp 1: Mass Production of Eggs and Early Fry**
Coche, A. G., et. al.: **Common Carp 2: Mass Production of Advanced Fry and Fingerlings in Ponds**
Crozier, Carl: **Soil Conservation Techniques for Hillside Farms: A Guide for Peace Corps Volunteers**
D'Itri, Frank M.: **Artificial Reefs: Marine and Freshwater Applications**

Delta Net and Twine: **Delta Net and Twine Catalogue**
Donahue: R. L., et. al.: **Our Soils and Their Management**
DuFour, Henry and S. Schraufnage: **Inland Fisheries in Sierra Leone: An Extension Workers Manual**
Edwards, Peter: **Food Potetial of Aquatic Macrophytes**
FAO: **Aquaculture Planning in Asia**
FAO: **Monitoring Fish Stock Abundances**
FAO: **Symposium on Aquaculture in Africa**
FAO: **Workshop On Controlled Reproduction of Cultivated Fishes**
FAO: **Report of the FAO Technical Conference on Aquaculture**
Fishelson, L. and Z. Yaron: **International Symposium on Tilapia in Aquaculture**
Fuller, Jefferson C.: **Management of Farm Ponds in South Carolina**
Gibbons, Michael J. and R. Schroeder: **Agricultural Extension**
Goldman, Charles R.: **Freshwater Crayfish**
Hafkes, E.H.: **Small Community Water Supplies**
Hallowell: **Cold and Freezer Storage Manual**
Hopkins, Kevin and Emmanual Cruz: **The ICLARM-CLSU Integrated Animal Fish Farming Project: Final Report**
HUD: **Basics of Concrete**
Huet, Marcel: **Textbook of Fishculture: Breeding and Cultivation of Fish**
Huisman, L. and W.E. Wood: **Slow Sand Filtration**
Huner, Jay V. and E.E. Brown: **Crustacean and Mollusk Aquaculture in the United States**
Jauncey, Kim and Barbara Ross: **A Guide to Tilapia Feeds and Feeding**
Jordan, Thomas D.: **A Handbook of Gravity-Flow Water Systems**
Lannam, James E. and R.O. Smitherman (editors): **Principles and Practices of Pond Aquaculture**
Leonard, David: **Traditional Field Crops**
Leonard, David: **Soils, Crops and Fertilizer Use**
Libert, L. and A. Mavcorp: **Mending Fish Nets**
Longland, F.: **Field Engineering**
Lovell, R.T.: **Laboratory Manual for Fish Feed Analysis and Fish Nutrition Studies**
Mann, H. T., and D. Williamson: **Water Treatment and Sanitation: Simple Methods for Areas**
May, R.C., R.S.V. Pullin, and V.G. Jhingram: **Summary Report of the Asian Regional Workshop on Carp Hatchery and Nursery Technology**
Milne, P.H.: **Fish and Shellfish Farming in Coastal Waters**
Mississippi Extension Service: **Principle Diseases of Farm Raised Catfish**
Needham and Needham: **A Guide to the Study of Freshwater Biology**
Netcraft: **Make Nets - Here's How**
Pagan-Font, F.A. and J. Zimet: **Film Commentary: Artificial Propagation of Chinese Carps**
Panayotou, Theodore: **The Economics of Catfish (*Clarias* spp.) Farming in Central Thailand**
Peace Corps/I.C.E.: **Simon Eleve des Poissons**
Peace Corps/I.C.E.: **Freshwater Fisheries Program Planning**
Peace Corps/I.C.E.: **New Crop Production Handbook**
Peace Corps/I.C.E.: **Audio-Visual/Communications Teaching Aids**
Peace Corps/I.C.E.: **Pan-African Fisheries Conference**

Peace Corps/I.C.E.: **Handbook for Aquaculture in Thailand**
Peace Corps/I.C.E.: **Comment Elever La *Tilapia nilotica***
Pillay, T.V.R.: **Planning of Aquaculture Development: An Introductory Guide**
Pullin, R.S. and R.H. Lowe-McConnell: **The Biology and Culture of Tilapias: Proceedings of the International Conference on the Biology and Culture of Tilapias**
Pullin, Roger (editor): **Integrated Agriculture/Aquaculture Farming Systems, Proceedings of the ICLARM-SEARCA Conference**
Riemer, Donald N.: **Introduction to Freshwater Vegetation**
Rothbard: **Induced Reproduction in Cultivated Cyprinids: The Common and Chinese Carps**
Saila, Saul B. (editor): **Stock Assessment for Tropical Small-Scale Fisheries**
Schoenen, Peter: **A Bibliography of Important Tilapias (Pisces: Cichlidae) for Aquaculture**
Shang: **Aquaculture Economics - Basic Concepts and Methods of Analysis**
Stickney, Robert R.: **Principles of Warmwater Aquaculture**
Storms, Kristen: **Guia Para La Cria de Peces en Estanques**, PC/Honduras
Sutherland, David: **Guia Ilustrada de Piscicultura**, PC/Honduras
Swiss Center for Appropriate Technology: **Appropriate Building Materials**
Swiss Center for Appropriate Technology: **Manual for Rural Water Supply**
Tave, Douglas: **Genetics for Fish Hatchery Managers**
Temprosa, Rosalinda: **Preliminary Bibliography of Rice-Fish Culture**
Time Life Books: **Illustrated Library of Cooking Fish**
Torrans, Les: **Blue Tilapia Culture in Arkansas**
Trewavas, Ethelwynn: **Tilapine Fishes of the Genera *Sarotherodon*, *Oreochromis*, and *Dankilia***
Ulltang, O.: **Methods of Measuring Stock Abundance Other Than by the Use of Commercial Catch and Effort Data**
UNICEF: **Improved Fish Smoking in West Africa**
U.N./FAO: **Small-Scale Processing of Fish**
U.N. Secratariat for WID: **Women in Development: A Resource List**
US Department of the Interior: **Third Report to the Fish Farmers**
USAID: **Water Management on Small Farms: A Training Manual for Farmers in Hill Areas**
USDA/Soil Conservation Service: **Conserving Soil**
USDA/Soil Conservation Service: **Ponds: Planning, Design, Construction**
Vergara, Benito S.: **A Farmer's Primer on Growing Rice**
Vickery, Deborah and James Vickery: **Intensive Vegetable Gardening for Profit and Self-Sufficiency**
Walne, P.R.: **Culture of Bivalve Molluscs: 50 Years Experience at Conway**
Watanabe, Wade O.: **Experimental Rearing of Nile Tilapia Fry (*Oreochromis niloticus*) For Salt Water Culture**
Watson, Peter R.: **Animal Traction**
Welcomme, R.L.: **The Fisheries Ecology of African Floodplains**
Woynarovich, E. and L. Horvath: **The Artificial Propagation of Warm-Water Finfishes: A Manual for Extension**
Yoshida, Steven: **Useful French Terms in Aquaculture, Fisheries and Fish Anatomy**

Reprints, articles, pamphlets:

Allison, R., R.O. and J. Cabrero: "Effects of High Density Culture on Reproduction and Yield of Tilapia aurea"

Almazan, G. and Claude Boyd: "Plankton Production and Tilapia Yield in Ponds"

Almazan, G. and Claude Boyd: "An Evaluation of Secchi Disk Visibility for Estimating Plankton Density in Fish Ponds"

Anderson, C.E., and R.O. Smitherman: "Production of Normal Male and Androgen Sex-Reversed *T. aurea* and *T. nilotica* Fed a Commercial Catfish Diet in Ponds"

Argent Chemical Labs: "A Guide to Induced Spawning, Maturation and Sex Reversal in Aquaculture"

Auburn University: "Use of Chemicals for Fish Pond Treatment"

Baker, D. A., and R.O. Smitherman: "Immune Response of *Tilapia aurea* Exposed to *Salmonella typhimurium*"

Baker, D.A., R.O. Smitherman, and T.A. McCaskey: "Longevity of *Salmonella typhimurium* in *T. aurea* and Water and from Pools Fertilized with Swine Waste"

Barash, H., I. Plavnik and R. Moav: "Integration of Duck and Fish Farming: Experimental Results"

Bardach, John: "Basic Fish Anatomy"

Bardach, John: "Foods, Digestion, Nutrition, and Growth"

Bayne, D.R.: "Quality Improving in Alabama's Small Streams"

Bayne, David R., David Dunseth, and Cecilio Garcia R.: "Supplemental Feeds Containing Coffee Pulp for Rearing Tilapia in Central America"

Boyd, Claude E.: "Aluminum Sulfate (Alum) for Precipitating Clay Turbidity from Fish Ponds"

Boyd, Claude E.: "Comparison of Five Fertilization Programs for Fish Ponds"

Boyd, Claude E.: "Comparisons of Water Analysis Kits"

Boyd, Claude E.: "Determination of Total Nitrogen and Chemical Oxygen Demand in Fish Culture Systems"

Boyd, Claude E.: "Evaluation of a Water Analysis Kit"

Boyd, Claude E.: "Evapotranspiration/Evaporation (E/E0) Ratios for Aquatic Plants"

Boyd, Claude E.: "Hydrology of Small Experimental Fish Ponds at Auburn, Alabama"

Boyd, Claude E.: "Influence of Evaporation Excess on Water Requirements for Fish Farming"

Boyd, Claude E.: "Liquid Fertilizers for Fish Ponds"

Boyd, Claude E.: "Managing Water Quality in Channel Catfish Ponds"

Boyd, Claude E.: "Nitrogen Fertilizer Effects on Production of Tilapia in Ponds Fertilized with Phosphrus and Potassium"

Boyd, Claude E.: "Nutrient Content of Offal and Small Fish from Some Freshwater Fish Cultures"

Boyd, Claude E.: "Pond Evaporation"

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Boyd, Claude E. and David Hunt: "Alkalinity Losses from Ammonium Fertilizers in Fish Ponds"

Boyd, Claude E. and D.J. Martinson: "Evaluation of Propellor-Aspirator-Pump Aerators"

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Jensen, John and R. Durborow: "Tables for Applying Common Fish Pond Chemicals"
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Sarig, S., and M. Lahav: "The Treatment with Lindane of Carps and Fishponds Infected with the Fish Louse Argulus"

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Shelton, James L. and Claude E. Boyd: "Correction Factors for Calculating Oxygen Transfer Rates of Pond Aerators"

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Snow J.R.: "Plastic Bags for Shipping Sac-Fry of Largemouth Bass"

Soderberg, Richard W.: "Aeration of Water Supplies for Fish Culture in Flowing Water"

Swingle, H.S.: "Biological Means of Increasing Productivity in Ponds"

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Tave, D., J.E. Bartels, and R.O. Smitherman: "Saddleback: a dominant, lethal gene in *Sarotherodon aureus* (Steindacher)"

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Tave, Douglas: "Female Transfer: A Technique to Produce Genetically Identifiable Families with *T. aurea*"

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Torrans, E.L. and Fran Lowell: "Effects of Blue Tilapia/Channel Catfish Polyculture on Production, Food Conversion, Water Quality and Channel Catfish Off-Flavor"

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Watson, N.R.: "Processed Piggery Waste as a Feed Material for *Cyprinus carpio*"

Weatherley, A.H., and B.M.G. Cogger: "Fish Culture: Problems and Prospects"

Wellborn, T.L., Thomas Schwedler, and J.R. MacMillan: "Channel Catfish Fingerling Production"

Whitwell, Ted: "Weed Control in Lakes and Farm Ponds"

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Yashouv, A.: "Biological Data on *Tilapia galilaea* and *Tilapia nilotica* in the Fish Ponds"

Yashouv, A., and J. Chervinski: "Evaluation of Various Food Items in the Diet of *T. nilotica*"

Yashouv, A., and J. Chervinski: "The Food of the *T. nilotica* in Ponds of the Fish Culture Research Station at Dor

Part Two: Tools and Technical Equipment/Materials

The following is a list of the tools and technical equipment/materials/supplies which should be available during training. The number preceeding each item represents the quantity of that item which would be needed for a group of 25 trainees.

Garden and Construction Tools

3	Pick-axes
5	Mattocks
8	Sickles
8	Garden rakes
5	Lawn rakes
5	Shovels (short handle)
5	Shovels (long handle)
5	Spades
1	Sledge hammer
8	Hoes
8	Machetes
8	Weed whips
2	Hedge trimmers
6	Wheelbarrows
1	5-hp portable pump with appropriate hoses (if appropriate)
1	5-gallon gas can
Brooms	At least one per area for which trainees are responsible, i.e., each shed, classroom, van, meeting area, etc.)

Hand tools

2	Pipe wrenches (aapropriate sizes for pipes on site)
2	3-foot carpenter's levels
1	Carpenter's square
1	Metric socket set
1	Socket set
5	Wood saws
3	Hack saws (plus extra blades)
3	Coping saws (plus extra blades)
1	Keyhole saw (plus extra blades)
1	Chalk line
2	1" wood chisels
2	Hand drills
2	Wood boring bit sets
6	Hammers
3	Hatchets
3	Masonry trowels
2	Tin snips
2	Wire cutters
2	Slip joint wrenches (one large, one small)
3	Crescent wrenches (assorted sizes)

3	Needle nose pliers
3	Pliers
3	Vise grips
5	Files
5	Flat-head screwdrivers (assorted sizes)
3	Phillip's head scredrivers (assorted sizes)
3	Steel meter sticks
2	Staple guns
2	Planes
3	50' Tape measures (in addition to those listed under Surveying Equipment)
2	Soil augers

Hardware, Miscellaneous Consumable Items

Good assortment of nails, screws, bolts, nuts, staples, hog rings, washers, etc.
Wire
Hardware cloth
Chicken wire
Duct tape
Masking tape
Electrical tape
Teflon tape
Bungi cords
Goat rubber
PVC pipe and fittings as appropriate for site PVC primer
PVC cement
Fishing line
Twine
Rope
WD 40
Gasket material
Silicone glue
Silicone sealant
Paints, epoxy ,etc.
Paintbrushes
Lumber as needed for projects and per trainee request
Electrical connectors, clamps, switches, etc. as needed Cement
Sand
Gravel

Scales/Balances

2	500-gram platform scales
2	2-kg spring scales
8	10-kg spring scales
1	10 kg hanging scale w/pan (weighing feed)
3	30-kg. hanging scales

Nets

5	Dip nets, long handle, 1" mesh
8	Dip nets, long handle, 1/4" mesh
3	Dip nets, short handle, fine mesh
3	Cast nets, 6' or 8' diameter, 1/4" mesh
2	Seines, 50' x 6', 1" mesh
2	Seines, 50' x 6', 1/2" mesh
3	Seines, 50' x 6', 1/4" mesh
1	Seine, 25' x 6', 1/8" mesh
3	Seines, 15' x 6', fine mesh (1/16")

Other Pond Equipment

50	5-gallon buckets
5	2-gallon buckets
5	15-gallon galvanized tubs
3	18-gallon galvanized tubs
8	Shrimp baskets
5	Large plastic garbage cans w/lids
5	Pairs waders, assorted sizes (if appropriate)
5	Plankton nets
15	Pocket thermometers (0 - 120°F)
8	Secchi disk (trainees can make these)
1	Transport tank
1-2	Agitators for transport tank
8	Water Quality Test Kits (Hach Model AL-36B is good)
2	Salinity test kits
3	Ammonia test kits
	(**Important Note:** For water chemistry kits, also have on hand plenty of refill reagents, extra glassware and other parts)

Surveying Equipment

4	Dumpy levels with tripods
4	Stadia Rods
4	100' tape measures (Note: Tape measure should be consistent with stadia rod regarding measurements, i.e., both should be either metric or English, if English both should be in inches tenths of feet)
500	Surveying flags
10	Rolls of flourescent tape
25	Hand levels
10	Line levels

Aquaculture Consumables and Chemicals (chemicals optional as appropriate)

Assortment of feeds in appropriate quantities (rice bran, cotton seed meal, wheat shorts, catfish and trout pellets and meals, etc.)

Assortment of fertilizers in appropriate quantities (10-10-10, 046- 0, manures, etc.)

Agricultural Lime

Grass seed

Rotenone
Potassium Permanganate
Salt
Dylox
MS-222
Formaldehyde

Additional equipment, supplies, etc. for technical work, seminars, fish fry

6	Filet knives
3	Sharpening stones
2	Coolers (for fish)
2	Aquarium (10 gallon) with pumps, filters, etc.
24	Mason jars
5	Dissecting kits
5	Dissecting pans
1	Microscope
1	Mortar and pestle
25	Net-making shuttles
10	Test tubes
5	Pairs of rubber gloves
2	Goggles

Microscope slides and cover slips
Pots, pans, bowls, utensils, etc. for fish fry if needed

Classroom and Office Supplies (What is listed in this section are common supplies that are made available to trainees and/or used in the classroom. This does not attempt to include all office supplies as needed for administrative purposes. Trainees may request many additional items for preparing visual aids and for other special projects.)
35 1-1/2" three ring binders
Lined notebook paper
Tabbed notebook dividers
Pencils
Ballpoint pens
Colored pencils
Rulers
Protractors
Newsprint Pads (large)
Poster board
Assorted waterproof markers
2 Flip-Chart stands
Poster paints
Small paintbrushes (assorted sizes)
Modelling clay
Scotch tape
3 hole-punch
Staplers and staples
Paper clips, spring clips, etc.

Clipboards - one per staff member
Steno pads
Blackboard
Chalk
Eraser
Slide projector
Screen
Carousels
Cassette player/recorder and blank cassette tapes

Miscellaneous, as needed
Recreational equipment (volleyball and net, basketball, frisbees, etc.)
Fire extinguisher(s)
All tools and supplies needed for vehicle maintenance
Tarps
Cleaning supplies
Insect repellent
First Aid supplies

Human Resources (Please also refer to Program Design Chapters)

- Expert in surveying techniques (preferably with experience related to pond construction)
- Expert in site selection, pond design and pond construction for aquaculture
- Aquaculture extension agents (or in other agricultural field)
- Fish farmers: preferably representing different levels of intensity, different levels of technology, different types of operations, different goals, species, etc.
- Aquaculture Researchers, university, government, private industry
- Expert in soils
- Expert in carpentry, masonry
- Fish nutritionist
- Parasite and disease diagnostician
- Marketing expert
- Agricultural economist
- Feed mill personnel
- Processing plant personnel
- Vendors of industry support equipment
- Expert(s) in general aquaculture concepts and principles
- Expert(s) regarding aquaculture development and programming issues both in the United States and overseas
- Fisheries Sector Specialist from Peace Corps/Washington
- Returned Peace Corps Volunteers from countries to which trainees are assigned (or other RPCV/fisheries who can serve as technical resources earlier in the program)
- Peace Corps field staff from countries to which trainees are assigned
- Local resources associated with community services, i.e., librarian, health care workers, policy makers, etc.)

Texts, Manuals and Equipment Given to Trainees to Take Overseas

Note: The decisions regarding what trainees receive to take with them overseas is based entirely on the request of the field staff in each country. The following is a list of materials that have been provided during past stateside programs.

Books:

- Balarin, John: **Tilapia - a guide to their biology and culture in Africa**
- Bardach, Ryther, McLarney: **Aquaculture: The Farming and Husbandry of Freshwater and Marine Organisms**
- Boyd, Claude: **Water Quality in Warmwater Fish Ponds**
- Brown and Gratzek: **Fish Farming Handbook**
- Chakroff, Marilyn: **Freshwater Fish Pond Culture and Management**
- Chakroff, Marilyn: **Cultivo y Manejo de Estanques Pesqueros de Agua Fresca**
- Jauncey, Kim and B. Ross: **A Guide to Tilapia Feeds and Feeding**
- Lannan, Smitherman and Tchobanoglous: **Principles and Practices of Pond Aquaculture**
- Needham and Needham: **A guide to the study of freshwater biology**
- Netcraft: **Make Nets - Here's How**
- Pullin, Lowe-McConnell: **The Biology and Culture of Tilapias**
- Pullin and Shehadeh: **Integrated Agriculture-Aquaculture Farming Systems**
- Stickney, Robert: **Principles of Warmwater Aquaculture**
- Yoshida, Steven: **Useful French Terms in Aquaculture, Fisheries and Fish Anatomy**

Equipment:

- Hand level
- Line level
- Spring scale, 20 lbs. x 4 oz. and 10 kg. x 100 gr.
- Pocket thermometer in case, 0- 120°F
- Hach Water Ecology Test Kit Model AL-36B
- pH test kit with extra reagents (LaMotte Kit #2117)
- Biscope, 100X
- Plankton net
- Cast net, 3' or 4' radius, 1/4" mesh
- Netting material; per request of country, usually 1/4" mesh, 6' deep Delta mesh
- Braided polypropylene rope, 1/4"
- Sponge floats
- Lead weights, 12 per lb.
- Roll of #9 tarred twine
- 1/4" plastic net shuttle

Suggestion regarding material for seine construction:

For a 10 meter seine, give trainee:	For a 15 meter seine, give trainee:
13.5 meters netting	20 meters netting
28 meters rope	38 meters rope
17 floats	25 floats
17 leads	25 leads
1 roll twine	1 roll twine